BLM Communications Use Lease to USAF to Conduct Patriot Communications Exercises in Lincoln County, Nevada

Draft Environmental Assessment

April 2008

DRAFT FINDING OF NO SIGNIFICANT IMPACT

1.0 NAME OF THE PROPOSED ACTION

Draft Environmental Assessment for BLM Communications Use Lease to USAF to Conduct Patriot Communications Exercises in Lincoln County, Nevada.

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

The United States Air Force (USAF) at Nellis Air Force Base (AFB) proposes to acquire a 15-year Communications Use Lease (CUL) from the Bureau of Land Management (BLM) to support ground-based Radar/Communications exercises at 14 5.7-acre sites (79.8 acres) in Lincoln County, Nevada. A maximum of five exercises annually for a period of 15 years would be conducted on public lands administered by the BLM located under Military Operations Area (MOA) airspace. The ground activities may require the participation of the United States (US) Army's Air Defense Artillery (ADA) battalions or other mission capable unit(s). The proposed action would provide USAF and US Army personnel with training that would replicate real-world scenarios to ensure combat ready forces during emergency situations worldwide and to protect national security.

The USAF also analyzed the No Action Alternative. Under the No Action Alternative, the 15-year CUL would not be granted to the USAF by the BLM and the proposed exercises would not occur. This alternative would limit the training scale available to Radar/Communications units and result in a reduction of combat readiness by limiting tactical scenarios available to both air and ground troops.

3.0 SUMMARY OF ENVIRONMENTAL CONSEQUENCES

Fourteen resource categories were thoroughly assessed to identify potential impacts that could result from implementation of the proposed action. The following summarizes results of the assessment by resource category.

Air Quality. Short-term, minor impacts to air quality from vehicle and generator use and support activities, such as cooking and diesel refueling, would occur. No impacts would occur under the No Action Alternative.

Biological Resources. Approximately 79.8 acres of locally and regionally common habitat would be disturbed during the proposed 15-year CUL for the exercises. Although disturbance would be relatively minor and infrequent at a single 5.7 acre site, routine use over a period of 15 years could degrade the sites. To minimize degradation, the sites would be reseeded after each exercise and BLM weed control measures would be implemented during each exercise. No impacts to threatened or endangered species would be expected. There is some potential that short-term, localized, minor impacts to sensitive wildlife species would occur during an exercise. No impacts would occur under the No Action Alternative.

Water Resources. Minor and short-term impacts to surface water and groundwater associated with temporary disturbance of dirt roadways would occur during each exercise. Containment measures, such as drip pans and portable containment berms, would be used during the proposed exercises to minimize

potential impacts to water resources from fuels, cleaning agents, and waste water. No impacts would occur under the No Action Alternative.

Earth Resources. Minor and short-term impacts to soil surfaces would occur during the proposed exercises. Disruption of soil surfaces could lead to increased erosion at sites. However, reseeding disturbed areas following completion of each session of exercises would minimize the potential for erosion. No impacts would occur under the No Action Alternative.

Land Use. The Proposed Action would not interfere with the current use of public lands in the region and is consistent with designated land uses. No impacts would occur under the No Action Alternative.

Aesthetics. Impacts to aesthetics would be minor, short-term, and consistent with BLM Class IV management objectives. No impacts would occur under the No Action Alternative.

Recreation. The proposed exercises would primarily occur in remote and low-use areas and thus, potential for impacts is minimal and these would be short-term and minor. The Proposed Action would not occur on recreation facilities or preclude access to recreation facilities in the area. No impacts would occur under the No Action Alternative.

Noise. Noise produced by the Proposed Action would generally be consistent with current baseline noise levels. Any potential impacts would be temporary and localized to rural areas where few, if any, sensitive receptors exist. Access routes to the LSA in Alamo would avoid the majority of sensitive receptors in the vicinity. No impacts would occur under the No Action Alternative.

Socioeconomics. No impacts would occur under the Proposed Action or the No Action Alternative

Transportation. Traffic impacts, primarily occurring during deployment and demobilization, would be minor and short-term. Typical impacts could include temporary congestion on roadways and delays due to slow-moving convoys. No impacts would occur under the No Action Alternative.

Hazardous Materials and Waste Handling and Disposal. No hazardous materials have been identified in the proposed radar/communications area. Containment measures, such as drip pans and portable containment berms, would be used during the proposed exercises to minimize potential impacts from hazardous materials and waste such as fuels, cleaning agents, and waste water. Solid waste would be consolidated in sealed waste containers each day during the proposed exercises and transported to an approved waste disposal location at the conclusion of each exercise session. No impacts would occur under the No Action Alternative.

Cultural Resources. No sites eligible for nomination to the National Register of Historic Places are located at the proposed Radar/Communications sites, therefore, no impacts to cultural resources would result from implementation of the Proposed Action. No impacts would occur under the No Action Alternative.

Utilities. No utility lines are present at the proposed Radar/Communications sites. Portable power sources would be used to meet energy needs during the proposed exercises. Therefore, the Proposed Action would have no impacts on utilities. No impacts would occur under the No Action Alternative.

Range. The proposed Radar/Communications sites were selected to avoid grazing facilities such as corrals and stock tanks, and other restricted areas, unless approved by the BLM. The proposed activities would not preclude access to active water troughs, and military vehicles would avoid livestock by maintaining speeds within posted speed limits and at slow speeds in off-road locations, where feasible. Due to the periodic nature of the proposed activities and the incorporation of the grazing and restoration SOPs, impacts to grazing would be temporarily adverse if permittees are ranging cattle during an exercise cycle but would not preclude access to grazing facilities. No impacts would occur under the No Action Alternative.

4.0 CONCLUSIONS

Based on the analysis and conclusions presented in the EA, conducted in accordance with the requirements of the National Environmental Policy Act, the Council on Environmental Quality regulations, and Air Force Environmental Impact Analysis Process, as promulgated in Title 32 of the Code of Federal Regulations Part 989, and after careful review of the potential impacts, I conclude that implementation of the Proposed Action or the Alternative Actions would result in no significant impacts on the quality of the human or natural environments. Therefore, a Finding of No Significant Impact (FONSI) is warranted, and an Environmental Impact Statement (EIS) is not required.

_____ _____

Timothy A. Byers
Brigadier General, USAF
Director of Installations and Mission Support

Date

CONCUR:

_____ _____

Jeffrey A. Weeks
Assistant Field Manager
Bureau of Land Management

Date

COVER SHEET
DRAFT ENVIRONMENTAL ASSESSMENT FOR BLM COMMUNICATIONS USE LEASE TO USAF TO CONDUCT PATRIOT COMMUNICATIONS EXERCISES IN LINCOLN COUNTY, NEVADA

A. Responsible Agency: United States Air Force (USAF)

B. Proposed Action: Obtain a 15-year Communications Use Lease (CUL) for 14 sites, located in Lincoln County, Nevada, to support ground-based Radar/Communications exercises. The sites are located in an area encompassing approximately 2.5 million acres of public lands in the Sand Springs Valley, Coal Valley, Delamar Valley, and Dry Lake Valley under MOA airspace.

C. Written comments and inquiries regarding this document should be directed to:

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In addition, the document can be viewed and downloaded from the internet at the following two websites:

www.nellis.af.mil/library/environment.asp

www.nv.blm.gov/ely/nepa/ea_list.htm

Hard copies are available for review at:

Las Vegas Library, Reference Department
833 Las Vegas Blvd.
North Las Vegas, NV 89101

Alamo Branch Library
100 South First West
Alamo, Nevada 89001-0239

Caliente Branch Library
100 Depot Ave.
Caliente, Nevada 89008-0306

D. Report Designation: Environmental Assessment (EA)

E. Abstract: This EA evaluates potential environmental impacts that would result from the implementation of the 15-year CUL requested by the USAF, Nellis Air Force Base (AFB), from the Bureau of Land Management (BLM) to support ground-based Radar/Communications exercises at 14 5.7-acre sites (79.8 acres) across Lincoln County, Nevada. The proposed Radar/Communications exercises would be associated with the creation of an IADS using Patriot radar communications and other electronic air defense systems. The IADS and Radar/Communications systems would be deployed on the Nevada Test and Training Range (NTTR) in up to five annual exercises for a period of 15 years.

The ground activities would require the participation of one of the United States Army's Air Defense Artillery (ADA) battalions or other mission capable unit. The proposed Radar/ Communications exercises would be conducted on public lands administered by the BLM located under Military Operations Area (MOA) airspace.

Preparation of the EA complies with the National Environmental Policy Act (NEPA) (42 U.S. Code [USC] § 4321 et seq.); the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [CFR] 1500–1508); Department of the Air Force Environmental Impact Analysis Process (EIAP) (32 CFR 989) Instruction 32-7061, which implements NEPA and CEQ regulations for Air Force Actions; and BLM 43 CFR 1600, Planning Regulations (Instruction Memorandum [IM] 2001-03).

The environmental resources potentially affected by the Proposed Action include air quality, biological resources, grazing, water and geological resources, land use, visual, recreation, noise, transportation, and hazardous materials. Adverse effects to these resources would be temporary, limited to small areas, and would occur in largely un-populated areas. Potential effects to biological resources would result in disturbance to approximately 79.8 acres of land, some of which has been subject to previous disturbance; however, impacts to federally listed species would be avoided. Most of the vegetation and wildlife located in the proposed exercise area consists of locally and regionally common species. Impacts to grazing would be minimized or avoided through measures such as consultation with permittees prior to the commencement of exercises. Impacts to archaeological sites have been avoided, and cultural material present within the project sites are not considered eligible for nomination to the National Register of Historic Places. Based on the nature of the exercises, the small areas utilized by the Radar/Communications crews, and the expansive area of the project region for the Proposed Action, the USAF has determined that impacts associated with these resources would not be significant.

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LIST OF FIGURES

98 RANW	=	98th Range Wing
AAR	=	After Action Reviews
ADA	=	Air Defense Artillery
AFOSH	=	Air Force Occupational Safety and Health
AR	=	Army Regulation
Army	=	U.S. Army
ARTEP	=	Army Training and Evaluation
BA	=	Biological Assessment
BAPC	=	Bureau of Air Pollution Control (Nevada)
BAQP	=	Bureau of Air Quality Planning (Nevada)
BLM	=	Bureau of Land Management
BLUFOR	=	Allied or "Blue" Forces
CAA	=	Clean Air Act (Federal)
CAPP	=	Chemical Accident Prevention Program
CCC	=	Command and Control Center
CCD	=	Census County Divisions
CCDAQM	=	Clark County Department of Air Quality Management
CCFD	=	Clark County Fire Department
CDFG	=	California Department of Fish and Game
CEQ	=	Council on Environmental Quality (40 CFR Parts 1500-1508)
CERCLA	=	Comprehensive Environmental Response, Compensation, and Liability Act (Superfund)
CFR	=	U.S. Code of Federal Regulations
CO	=	Carbon Monoxide
CUL	=	Communications Use Lease
CWA	=	Clean Water Act of 1977 (33 U.S.C. 1251 et seq.) (formerly the Federal Water Pollution Control Act of 1972)
dB	=	Decibel
dBA	=	Decibel (A-weighting network)
DOD	=	Department of Defense
DoDI	=	Department of Defense Instruction
DOE	=	U.S. Department of Energy
DOI	=	U.S. Department of the Interior
DOT	=	U.S. Department of Transportation
EA	=	Environmental Assessment
EDR	=	Environmental Data Resources, Inc.
EIAP	=	Environmental Impact Analysis Process
EIS	=	Environmental Impact Statement
EO	=	Executive Order
EPF	=	Environmental Planning Function
ESA	=	Endangered Species Act of 1973, 1988 Amendments (16 USC § 1531 et seq.)
FAA	=	Federal Aviation Authority
FOC	=	Fiber Optic Cable
FONSI	=	Finding of No Significant Impact
GPS	=	Global Positioning System
HAZMART	=	Hazardous Material Pharmacy
HMA	=	Herd Management Areas

HMMWV	=	High-Mobility Multipurpose Wheeled Vehicle
IADS	=	Integrated Air Defense System
IM	=	Instruction Memorandum
JNTC	=	Joint National Training Capabilities
JRF-05	=	Joint Red Flag '05 Exercise
Leq	=	Equivalent Continuous Sound Level
Lmax	=	Maximum Sound Level
Lmin	=	Minimum Sound Level
LSA	=	Logistics Support Area
lsd	=	land surface datum
MLA	=	Main Line of Resistance
MOA	=	Military Operations Areas
NAAQS	=	National Ambient Air Quality Standards
NAC	=	Nevada Administrative Code
NAFB	=	Nellis Air Force Base
NATO	=	North Atlantic Treaty Organization
NDEP	=	Nevada Division of Environmental Protection
NDOT	=	Nevada Department of Transportation
NDOW	=	Nevada Department of Wildlife
NEPA	=	National Environmental Policy Act (42 USC § 4321 et seq.)
NNHD	=	Nevada Natural Heritage Division
NOx / NO_2	=	Nitrogen Oxide / Nitrogen Dioxide
NPDES	=	National Pollution Discharge Elimination System
NPS	=	U.S. National Park Service
NRS	=	Nevada Revised Statutes
NTTR	=	Nevada Test and Training Range
OSHA	=	U.S. Department of Labor Occupation Safety & Health Administration
PEL	=	Permissible Exposure Limit
PM10 / PM2.5	=	Particulate matter equal to or less than 10 microns in size/Particulate matter equal to or less than 2.5 microns in size
Forces		
RF	=	Radio Frequency
RMP	=	Resource Management Plan
SFF	=	State Forester Fire Warden
SHPO	=	State Historic Preservation Office
SIP	=	State Implementation Plan
SOP	=	Standard Operating Procedures
SOx / SO_2	=	Sulfur Oxide/Sulfur Dioxide
SR	=	State Route
Superfund	=	Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
SWPPP	=	Storm-Water Pollution Prevention Plan
TRI	=	Toxic Releases
TSCA	=	Toxic Substance Control Act
USACE	=	United States Army Corps of Engineers
USAF	=	United States Air Force
U.S. Army	=	United States Army
USC	=	U.S. Code

USEPA	=	United States Environmental Protection Agency
USFS	=	United States Forest Service
USFWS	=	United States Fish and Wildlife Service
USGS	=	United States Geological Survey
VRM	=	Visual Resource Management
WMA	=	Wildlife Management Area

SECTION 1.0
PURPOSE OF AND NEED FOR ACTION

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1.0 PURPOSE OF AND NEED FOR ACTION

1.1 SCOPE OF THE ENVIRONMENTAL ASSESSMENT

This Environmental Assessment (EA) presents an analysis of potential environmental impacts that would result from a 15-year Communications Use Lease (CUL) requested by the United States Air Force (USAF), Nellis Air Force Base (AFB), from the Bureau of Land Management (BLM) to support ground-based Radar/Communications exercises at 14 5.7-acre sites (79.8 acres) across Lincoln County, Nevada. The proposed Radar/Communications exercises would be associated with the creation of an Integrated Air Defense System (IADS) using Patriot radar communications (current technology), although future technologies may be employed as they become available. The IADS and Radar/Communications systems would be deployed on the Nevada Test and Training Range (NTTR) in up to five annual exercises for a period of 15 years. The ground activities would require the participation of one of the United States Army's Air Defense Artillery (ADA) battalions or other mission capable unit. The proposed Radar/Communications exercises would be conducted on public lands administered by BLM located under Military Operations Area (MOA) airspace.

This EA has been prepared to evaluate the potential for the proposed CUL and associated exercises to significantly impact land use, visual resources, air and water quality, safety and human health, biological and cultural resources, geology, soils, grazing, and socioeconomics, as well as the potential to create hazardous material impacts, hazardous and solid waste impacts, and noise impacts to the natural and social environment. Preparation of the EA complies with the National Environmental Policy Act (NEPA) (42 U.S. Code [USC] § 4321 et seq.); the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [CFR] 1500–1508); 32 CFR 989, Department of the Air Force Environmental Impact Analysis Process (EIAP), which implements NEPA and CEQ regulations for Air Force Actions; and BLM 43 CFR 1600, Planning Regulations (Instruction Memorandum [IM] 2001-03).

1.2 PURPOSE AND NEED FOR THE PROPOSED ACTION

Large-scale, multi-force, military training exercises regularly occur at Nellis AFB and the NTTR, located in southern Nevada. These exercises, known as "Red Flag", provide for realistic joint training for multi-service and North Atlantic Treaty Organization (NATO) forces. Red Flag exercises routinely consist of air-to-air combat training that is conducted within NTTR restricted airspace and in MOA airspace surrounding the NTTR.

Current world conflicts require considerable cooperative efforts between ground and air troops. During the first Gulf War, communication and targeting errors resulted in the loss of friendly aircraft during combat sorties. Continued real-world training is required to reduce the potential for these losses in future conflicts. Casualties have been significantly decreased through participation in training exercises that electronically replicate real-world battlefield conditions that troops would encounter during their initial flying missions.

While the NTTR is the world-class training range for the USAF, the NTTR does not possess the required resources to train both ground and air systems against a full-spectrum battlefield environment. In March 2005, the BLM granted the USAF a temporary CUL for eight sites in the Delamar Valley area to conduct Red Flag Exercises utilizing ground-based ADA and radar units. These Radar/Communications exercises involved ground-to-air, air-to-air, and air-to-ground combat scenarios in combined, multi-service arms settings that realistically replicated probable combat conditions. US Army Patriot and Avenger Batteries and Sentinel Radar Systems were used in the exercises to provide US Army and USAF units high-quality realistic training (USAF, 2005).

During the course of the 2005 exercise, the air battle quickly moved outside of the range and horizon of the approved sites, limiting the effectiveness of the training exercise. The USAF and US Army determined that to remedy this deficiency, radar/communications sites should be more widely spaced at the periphery of MOA airspace currently used for air combat training and testing exercises over Lincoln County, Nevada. This would allow for optimal training of both ground and air systems against a full-spectrum battlefield environment. In addition, a long-term CUL would be required so that highly effective combat training could be regularly incorporated into Red Flag exercises.

Implementation of the proposed exercises within the proposed 79.8-acre CUL would provide USAF and US Army troops the required practical training to ensure national security and combat-ready forces during emergency situations. Training on defense systems is necessary to maintain combat readiness and refine response time, accuracy, and alertness. The area proposed for the Radar/Communications exercises would best simulate potential battlefield conditions, thus providing troops with consistent training on these dynamic new developments in weapons systems and tier components. This will ultimately result in reduced fratricide.

SECTION 2.0
DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

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2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

2.1 INTRODUCTION

This section presents a description of the proposed action and alternatives, including the No Action alternative. One of the most important aspects of the NEPA environmental review process is the identification and assessment of reasonable alternatives that have the potential for avoiding or minimizing the impacts of a proposed action. In addition to mandating consideration of the No Action Alternative, NEPA Regulations (32 CFR 989.8; 40 CFR § 1502.14) emphasize the selection of a range of reasonable alternatives and the adequate assessment of these alternatives to allow for a comparative analysis for consideration by decision-makers. During the development of the Proposed Action, a range of alternative site locations were reviewed to determine the adequacy of the sites based on project objectives and purpose and need. Based on the location of the existing MOA, the purpose and need of the Proposed Action, and the scale of the proposed air battle, only the No Action Alternative was identified as an alternative to the Proposed Action (i.e., the Radar/Communications exercises).

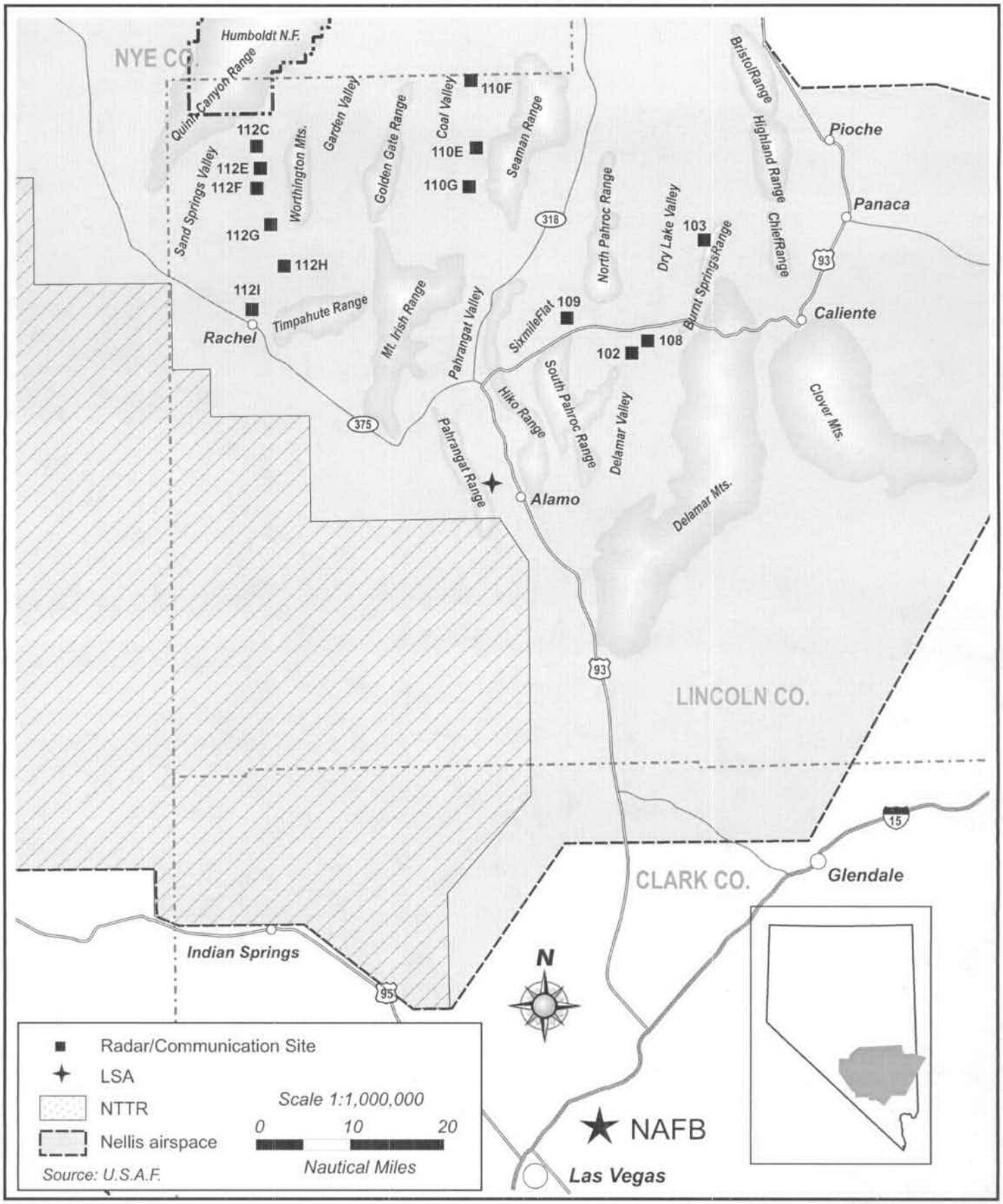
Alternatives that do not meet the purpose and need, do not clearly offer the potential to reduce significant environmental impacts, and do not conform to the NEPA requirements for feasibility (reasonableness) were eliminated from further analysis. The feasibility of potential alternatives was assessed taking the following factors into consideration:

- **Economic Feasibility.** Is the alternative so costly that implementation would be prohibitive?
- **Environmental Feasibility.** Would implementation of the alternative cause substantially greater environmental damage than the proposed Project, thereby making the alternative clearly inferior from an environmental standpoint?
- **Legal Feasibility.** Do legal protections on lands preclude or substantially limit the feasibility of the alternative?
- **Social Feasibility.** Would the alternative cause significant damage to the socioeconomic structure of the community and be inconsistent with important community values and needs?
- **Technical Feasibility.** Is the alternative feasible from a technological perspective, considering available technology? Are there any construction, operation, or maintenance constraints that cannot be overcome?

For the screening analysis, the economic, environmental, legal, social, and technological feasibility of potential alternatives was assessed. The assessment was directed towards reverse reason; that is, a determination was made as to whether there was anything about the alternative that would be infeasible on economic, environmental, legal, social, and technological grounds. In the final phase of the screening analysis, the environmental advantages and disadvantages of the alternatives were carefully weighed with respect to potential for overall environmental advantage, feasibility, and consistency with the purpose and need of the proposed Radar/Communications exercises.

2.2 DESCRIPTION OF THE PROPOSED ACTION

The USAF proposes to obtain a 15-year CUL for 14 Patriot sites (sites), or other electronic air defense systems, located in Lincoln County, Nevada (Figure 2-1) to support training with an integrated air defense system (IADS) utilizing, for example, the Patriot missile system (current technology), although



Radar/Communication Site Locations

Patriot Communications Exercise

Figure 2-1

future technologies may be employed as they become available. This would allow NTTR to train both ground and air systems against a full spectrum battlefield environment. The Patriot's role in the proposed action is to exercise the long range radar identification and targeting of enemy aircraft and communicate that information forming an IADS. Emphasis is on the identification of hostile aircraft, communicating crucial time-sensitive information to appropriate command and control elements, and integrating both ground and airborne weapons under combat conditions. No firing of weapons would occur throughout the exercises (i.e., no ammunition or launchers would be used); only use of radar technology would by employed.

The proposed Radar/Communications sites (sites) consist of fourteen (14) 500 feet by 500 feet areas (5.7 acres) for a total of approximately 79.8 acres. This includes a Logistics Support Area (LSA). The sites are located in an area encompassing approximately 2.5 million acres of public lands in the Sand Springs Valley, Coal Valley, Delamar Valley, and Dry Lake Valley under MOA airspace (Figure 2-2). The LSA and Patriot sites 102, 103, 108, and 109 were previously analyzed and approved for use by the BLM in the Joint Red Flag 05' EA (USAF 2005). The legal descriptions of the Patriot sites are shown in Table 2-1, below. UGSG maps depicting the subject parcels are provided in Appendix A.

Table 2-1. Legal Descriptions of Patriot Sites

Site	Legal Description (Mount Diablo Meridian)
LSA	T 7 S, R 60 E, S ¼ of SE ¼ of SE ¼ of NE ¼ of Section 1 and the E ½ of NE ¼ of NE ¼ of Section 12
102	T 4 S, R 63 E, SE ¼ of SW ¼ of SE ¼ and SW ¼ of SE ¼ of SE ¼ of Section 26, and NE ¼ of NW ¼ of NE ¼ of Section 35
103	T 4 S, R 65 E, NW ¼ of SE ¼ of SE ¼ of Section 18
108	T 4 S, R 63 E, S ¼ of SW ¼ of SW ¼ of Section 18 and the N ¼ of NW ¼ of NW ¼ of Sec. 19
109	T 4 S, R 62 E, E ¼ of SE ¼ of SW ¼ and W ¼ of SW ¼ of SE ¼ of Section 9
110E	T 1 N, R 60 E, SE ¼ of SW ¼ of SW ¼ and SW ¼ of SE ¼ of SW ¼ of Section 23, and NE ¼ of NW ¼ of NW ¼ and NW ¼ of NE ¼ of NW ¼ of Section 26
110F	T 2 N, R 60 E, S ½ of SW ¼ of NW ¼ of Section 15
110G	T 1 S, R 60 E, SW ¼ of SE ¼ of Section 23
112C	T 1 N, R 56 E, S ½ of SW ¼ of NW ¼ of Section 21
112E	T 1 S, R 56 E, E ¼ of NW ¼ of NE ¼ and W ¼ of NE ¼ of NE ¼ of Section 4
112F	T 1 S, R 56 E, E ¼ of SW ¼ of NW ¼ and W ¼ of SE ¼ of NW ¼ of Section 16
112G	T 2 S, R 56 E, E ¼ of SW ¼ of SE ¼ of Section 3
112H	T 2 S, R 56 E, SE ¼ of NE ¼ of NW ¼ and SW ¼ of SW ¼ of NE ¼ of Section 36
112I	T 3 S, R 56 E, SW ¼ of SW ¼ of NW ¼ and NW ¼ of NW ¼ of SW ¼ of Section 32

Beginning in 2008, the proposed Radar/Communications exercises would occur approximately five times a year for a period of 15 years. Each exercise would last approximately 21 days and could occur at any time of the year based on the schedule and timing of various air exercises. Although the exact number of personnel may change depending on the scope of the exercise, the maximum number of equipment and troops would include up to 75 vehicles and 120 personnel. The USAF would invite the US Army to participate in each exercise. The US Army would conduct all ground operations and the USAF would conduct all air operations. Participants and equipment for the proposed Radar/ Communications exercises would travel from Nellis AFB in Clark County, Nevada. Supplemental or

excess equipment not required for immediate use in the exercise would be stored at Nellis AFB. A concise summary of the exercise is described in Table 2-2.

Table 2-2. Summary of Proposed Patriot Integrated Air Defense System Exercise

Exercise Parameters	General Description of Schedule or Activity
Schedule	The Radar/Communications exercises would occur year round depending on scheduled air exercises. Three Patriot batteries would be deployed for a 21-day period five times each year for a period of 15 years.
Command/Control Center	Command Control Center could be at any of the sites depending on the scenario.
Logistic Area	Alamo airfield would be used as a replenishment location for fuel and equipment. Support vehicles and equipment include approximately 20 heavy-duty cargo trucks that include water trucks, fuel trucks and general purpose cargo trucks. Approximately 12 light-duty trucks would be used to transport supplies and personnel between the sites.
Patriot Batteries	13 Patriot Sites. Three batteries per exercise. Patriot batteries would utilize multiple sites in response to the air battle. Each site would support approximately four heavy duty trucks and 30 personnel. Sites would be selected to avoid competing land uses such as livestock grazing in coordination with BLM.
Troop Numbers	A maximum of 120 personnel

In order to simulate a combat situation, the exercise participants would be divided into allied, or "Blue Forces" (BLUFOR), and adversary, or "Red Forces" (REDFOR). Both forces would deploy aircraft during the proposed Radar/Communications exercises. The aircraft operations proposed for these exercises would be the same as ongoing air exercises that occur in the restricted airspace and MOA's surrounding the NTTR.

During ground exercises, the allied forces, or BLUFOR, would electronically simulate deployment of ground-based missile systems at a combination of pre-selected sites and BLM approved areas of opportunity along existing roadways. Both forces would then try to identify, target, and electronically defeat the systems and tactics of the adversary force. As the air war progresses, the Radar/ Communications units would re-deploy to the sites closer to the main line of resistance (MLR). BLUFOR units would be located east of the NTTR and the adversary, or REDFOR, forces would be located to the west. The BLUFOR aircraft would travel west to engage REDFOR aircraft while exercising their ability to locate, intercept, and neutralize threats.

In addition to the BLUFOR, REDFOR, and Radar/Communications units, a neutral force would also be involved in the exercises. The neutral force would control the exercises and monitor progress, test new equipment or procedures, ensure safety, and ensure compliance with environmental restrictions. The proposed Radar/Communications exercises would involve the following phases in planning, conducting, and closing out the exercise: (1) exercise preparation, (2) deployment of forces and joint training exercise, and (3) exercise review.

2.2.1 Exercise Preparation

The exercise preparation phase includes selecting sites and alternative sites that may be used by ground forces, which would avoid competing land uses such as livestock grazing, conducting any site preparation required prior to deployment, such as photo documentation and inspection, and refining standard operating procedures (SOPs) to ensure compliance with BLM and USAF requirements.

110F

112C

110E

112E

112F

110G

112G

103

112H

112I

109

108

102

LSA

NORTH

		Scale: 1" = 27,500' Date: February 29, 2008 File: 1118-4nellisafbpt4.dwg	**Radar/Communications Site Locations**	**Figure 2-2**

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Site Selection

During the proposed Radar/Communications exercises, ground-based field units would deploy four unit types: Patriot and Sentinel mobile/transient units, the Command and Control Center (CCC), and the LSA. There would be 13 locations where Patriot units could potentially be placed, but only three sites would be utilized at any given time during an exercise. The Sentinel mobile/transient units would use existing dirt access roads, disturbed areas, and two-tracks in the project area. During the exercises the Sentinel mobile/transient units would be limited to use of the road shoulders of the existing roadways or two tracks. The CCC site would be placed at one of the proposed sites. The LSA would be located at the Alamo airfield on an unused portion of the taxiway/runway. Patriot units, Sentinel units and the CCC unit would not be placed at the Alamo Airport site. During the proposed Radar/Communications activities, civilian air traffic would be able to use the airfield. Section 2.2.2 contains detailed descriptions of each site type.

The locations for the proposed Radar/Communications sites were based on several criteria and selected in cooperation with the BLM. The Radar/Communications sites were located in areas that had been subject to previous disturbance to avoid sensitive resources while still providing the most meaningful training opportunities. Sites that contained cultural or historic resources, sensitive biological resources, important grazing or range facilities, were excluded from the exercise. Some of the criteria include, but may not be limited to, the following:

Training Criteria:

- Slope less than 10 percent
- Site must have adequate tactical radar viewing angles
- Sites need line-of-site (or one relay point) visibility from each other and the CCC
- Located near the existing line of battle.

Environmental Criteria:

- Avoid areas containing cultural or historic resources
- Avoid locations that may impact federally- or state-listed threatened, endangered, or candidate species and species of special concern
- Avoid areas considered sensitive because of high biodiversity
- Avoid arroyos and riparian habitat
- Avoid grazing facilities, such as corrals and stock tanks unless approved by the BLM
- Avoid areas containing important wildlife habitat
- Avoid Areas of Critical Environmental Concern Remain outside Wilderness Study Areas
- Avoid locations with low or poor bearing soils
- Avoid restricted areas.

2.2.2 Deployment of Forces for Patriot Integrated Air Defense Systems Exercise

As described above, the proposed exercises would consist of a simulated battle between BLUFOR and REDFOR forces attempting to locate and defeat each other's weapons and defense systems. The ground-based units would include Patriot Batteries or other electronic air defense systems, and Sentinel Radar Systems. As future weapon systems are developed these systems would be deployed with or in lieu of existing systems provided the project footprint and impacts remain within the designated sites. Approximately 75 vehicles and up to 120 personnel would be involved in the proposed Radar/Communications activities and would deploy to field locations. These include two Patriot Batteries of approximately 16 vehicles and up to 30 troops each and three Sentinel Radar Systems comprised of two vehicles and six troops each. The proposed activities would also involve associated command and control, maintenance, communication, troop carriers, and other support vehicles and personnel.

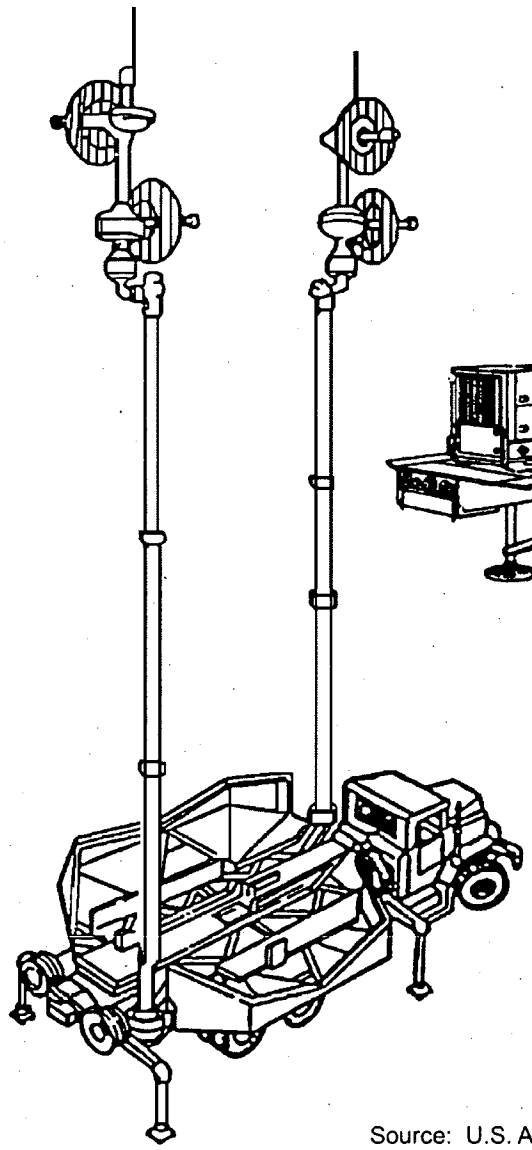
One of the essential tasks for the ground forces is to communicate indications and tactical information to air units. The number and size of these systems is unknown; however, the expectation is that the crews and equipment would be small and able to integrate into the Patriot sites. The US Army and USAF are also requesting the battalion to support a number of tactical experiments and tests, from command and control testing through joint air and missile doctrine development.

Patriot Battery Unit

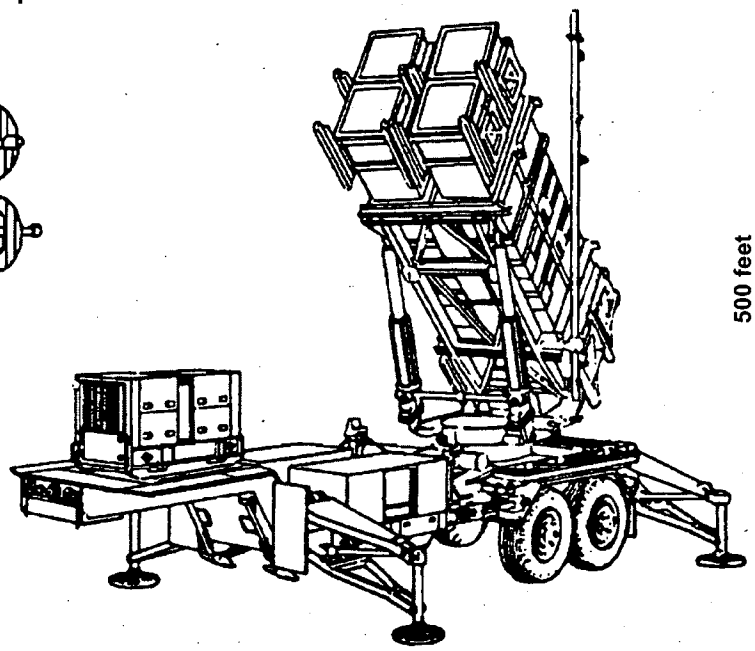
Each Patriot Radar/Communications site would support approximately six large trucks, twelve assorted general purpose vehicles, and 30 troops. Typical equipment at each site would include two launchers, a radar station, power plant/generator, control station, antenna masts, and other support equipment. Live missiles would not be used or present within the weapon systems during the exercises. If grounding rods are used during the proposed exercises, they would be removed at the completion of each exercise. Each Patriot site would billet (lodge) approximately 30 soldiers, thereby requiring two to three tents, a mobile field kitchen, shower, and toilet facilities. Most of these facilities would be located just inside the entry point near the perimeter of the Radar/Communications site. Figure 2-3 shows a typical Patriot Battery layout, types of equipment that would be located on each site, and the areas of potential disturbance.

The perimeter of each of the proposed Radar/Communications sites would be established and delineated with flagging, exclusion tape, or snow fencing prior to emplacement to prevent the disturbance of adjacent habitat. No razor wire or concertina would be used. Ground disturbance would occur from vehicle traffic, grounding rods, and perimeter fencing. To minimize soil disturbance during the emplacement of equipment at the Radar/Communications sites, vehicles would operate at reduced speeds (5 mph) and a single path would be utilized to position the launchers. However, the entire 5.7-acre site could be subject to disturbance.

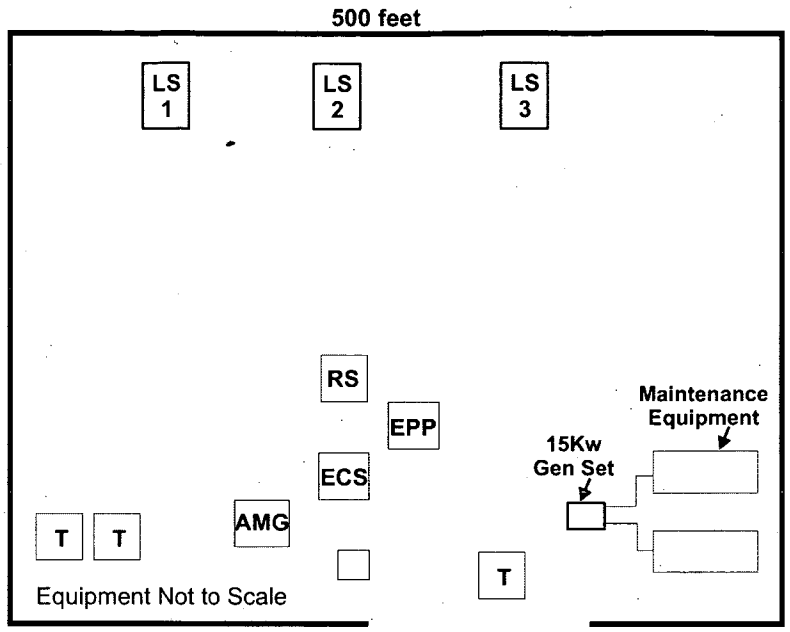
Antenna Mast Group



Patriot Launching Station

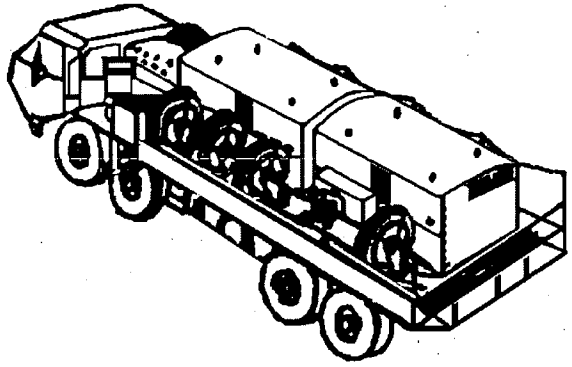


Typical Patriot Site Diagram



LS = Launching Stations
RS = Radar Station
EPP = Electric Power Plant
ECS = Engagement Control Station
AMG = Antenna Mast Group
T = Tent

Electrical Power Plant



Source: U.S. Army, 2004

Patriot Battery Unit

Patriot Communications Exercise

Figure 2-3

Once in place the launchers would remain stationary and routine maintenance would be completed utilizing a high-mobility multipurpose wheeled vehicle (HMMWV) or similar vehicle. In addition, the entry control point would be located next to the closest access road and clearly identified with flagging or signage. Most of the activities at a Patriot site would be concentrated around the billeting and control stations and near the control, radar, and firing units. As a result, much of the area in front of the Patriot firing units would be subject to minimal disturbance. The resulting pattern of disturbance would be hourglass-shaped with the heaviest potential disturbance located at the entry point, spreading out towards the billeting and the control center, narrowing in by the power plant and radar unit, and fanning out again by the launchers. To minimize disturbance only one point of entry would be authorized per site. Based on the tactical scenario, each Patriot Battery would relocate at least once during each exercise.

Sentinel Sites

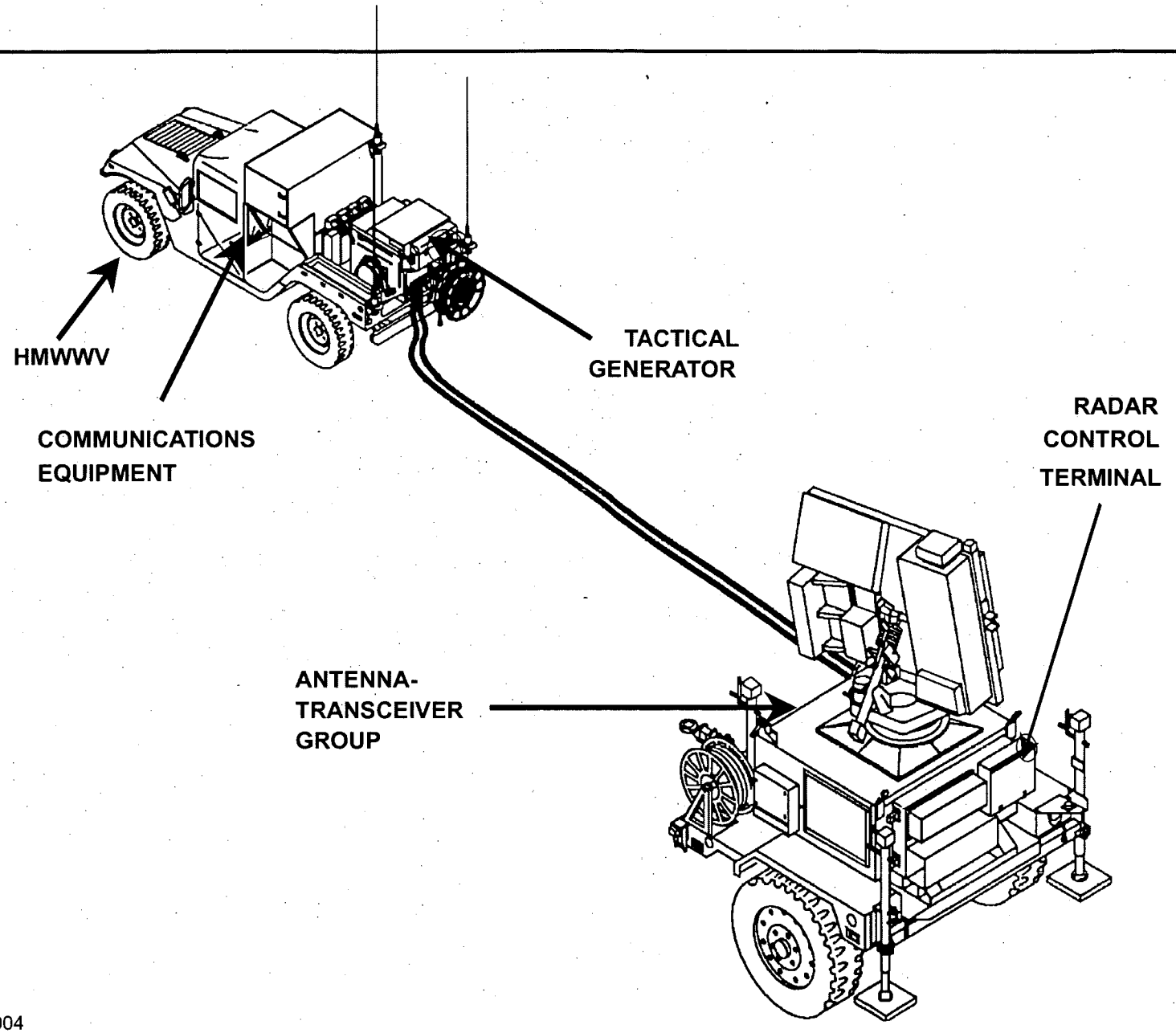
The Sentinel System consists of a trailer-mounted radar system consisting of an antenna transceiver group mounted on a high-mobility trailer towed by a HMMWV (Figure 2-4). The unit is typically emplaced and operated by up to six soldiers. The role of the unit is to alert the CCC and other Radar/Communications teams of hostile and unknown aerial threats. The system also links other Patriot and Sentinel units electronically by both voice and electronic data streams.

The Sentinel Systems would deploy to transient sites during the proposed exercises utilizing existing roads and dirt two-tracks. These sites would contain one or two Sentinel units or a rubber-tired communications vehicle. Transient sites would be located on the existing dirt road or road shoulder and would be utilized for a maximum of four hours. The transient sites do not include sandbag berms, kitchen, shower, or toilet facilities, but would have access to portable latrines in the vicinity for proper field sanitation. The Sentinel units would bivouac at the LSA or the approved Patriot sites.

Based upon the tactical scenario, weather conditions, terrain, NTTR management restrictions, and required battlefield survivability, these units would move frequently during the proposed exercises. By using mobile/transient sites, the Sentinel units would be able to move after each live-fly exercise, allowing them the benefit of locating to a different terrain between exercises. Each transient site would be identified by the environmental monitoring teams using GPS coordinates, and a monitoring checklist would be completed. This would enable the environmental monitoring teams to identify the site during the After Action Review (AAR).

Logistics Support Area

The Logistic Support Area would be used to stage equipment and replenishments for the field units during the Exercises. The site is located at the Alamo airfield, an un-improved dirt landing strip located approximately one mile west of the community of Alamo. The landing field is located on public lands and is administered by the BLM. All activities at this site would be restricted to the existing airfield



Source: U.S. Army, 2004

Sentinel System

Patriot Communications Exercise

Figure 2-4

environs and the perimeter of the area would be clearly identified by flagging or signage. Support vehicles and equipment would include approximately 20 to 25 heavy-duty cargo trucks, two fuel trucks, 12 to 15 light-duty utility trucks, and 4 to12 generators, depending on mission requirements. Access to and from the airfield would require travel through the town of Alamo and, to the maximum extent practicable, would only occur during daylight hours.

Vehicle speeds associated with the exercises would remain within the posted speed limits on the approved access roads through Alamo. Access to the LSA would occur via Broadway/1st Street West/Airport Road, unless otherwise directed by local law enforcement. 1st Street South would not be used to access the LSA to minimize potential noise impacts to the Pahranagat Middle School. The route would be flagged and identified on all military maps prior to deployment. Replenishments would be sent from the Alamo airfield to the Patriot batteries as necessary. The location of the LSA would provide for the efficient movement of supplies to the field and would limit extensive vehicle travel to Nellis AFB or other military facilities, such as the Tonopah Test Range Complex.

Command and Control Center

The CCC is the operational command center for the proposed Radar/Communications activities. This site would act as the fire control center during the exercise and would direct the Patriot and Sentinel units in the field. The CCC could be located at any of the approved sites based on the tactical requirements of the air battle.

2.2.3 Exercise Review

Each of the Radar/Communications sites utilized during the proposed ground activities would be inspected by the BLM and Nellis AFB personnel prior to and at the conclusion of the exercise. Each site would be photographed and the existing site conditions documented in AAR's prepared by Nellis AFB (98 RANW/XPL) for the BLM.

2.3 Measures Incorporated in the Proposed Action to Reduce Environmental Impacts

Several mechanisms have been incorporated into the proposed ground activities that would reduce or avoid known potential impacts to sensitive resources. In addition to environmental criteria identified for the selection of each Radar/Communications site, the USAF has developed SOPs that have been incorporated into the proposed ground activities to minimize or avoid potential impacts. Please see Appendix B for the full text of each SOP.

2.4 Alternatives to the Proposed Action

Alternative A: No Action Alternative

Under the No Action Alternative, the 15-year CUL would not be granted by the BLM and impacts associated with the Proposed Action would not occur. This alternative would not allow the NTTR to develop an IADS to train both ground and air systems against a full spectrum battlefield environment

which would result in the loss of realistic ground-to-air combat condition training, reduce the theater coordination required to reduce fratricide, and delay system upgrades to electronic air defense systems. The No Action Alternative would limit the training scale (i.e., large operating area under the MOA) available to Radar/Communications units and result in a reduction of combat readiness by limiting tactical scenarios available to both air and ground troops during a time of ongoing military conflict.

Training air and ground units in a full spectrum battlefield environment is required to resolve tactical issues with communications and targeting that has resulted in fratricide. Continuous training on electronic air defense systems in a theater range area is also required to maintain combat readiness and to refine response time, accuracy, and alertness. New developments in various components of weapons systems also require constant training. Continuous training is in demand as new troops are enlisted and/or others are promoted, transferred, or deployed. Under the No Action Alternative U.S. military troop readiness would suffer and some military units may not meet the operational requirements required prior to foreign deployment.

2.5 ALTERNATIVES CONSIDERED AND ELIMINATED FROM FURTHER STUDY

Several alternatives were assessed for their potential to reasonably achieve the project objectives and reduce potential environmental impacts of the proposed exercises. Also, their feasibility was evaluated. Based on these screening criteria, the alternatives listed below were eliminated from further consideration. The following discussions describe these potential alternatives and the basis for their elimination.

2.5.1 Alternative Site Locations

Under this alternative, the proposed Radar/Communications exercises would be limited to the previous sites utilized during the March 2005 Joint Red Flag exercise. These sites were located in the Delamar Valley and Long Valley, which proved to be marginal locations from an operational/exercise perspective due to the constraints of the NTTR airspace. The current airspace limits the flow of the air battle and aircrews are unable to rotate easterly. This limits the training effectiveness of the Delamar/Long Valley Patriot locations as they quickly fall out of the air war as the battle moves west. Sites located in the Delamar/Long Valley areas are adequate for the first day of the simulated war and are important Radar/Communications locations; however the sites have no value as the simulated air war pushes west. Without access to sites located west of Delamar/Long Valley, the effectiveness of the exercise is limited as the electronic air defense systems require adequate horizons to the west. Additional sites were also reviewed in numerous locations across the MOA. However, these sites were rejected based on environmental concerns (i.e. cultural and biological resources).

2.5.2 Simulated Exercises

Under this alternative, the proposed Radar/Communications exercises would be conducted utilizing simulators with no field deployment of troops or equipment. Currently, Radar/Communications units routinely utilize electronic simulators as an integral component to battlefield training, but require field mobilization to simulate real-world battlefield conditions. Conducting training as a completely simulated

exercise, with no field deployment, would seriously limit the effectiveness of the proposed Radar/Communications exercises as a tool to develop functional integration of forces and would not meet the purpose and need of the proposed Radar/Communications exercises. To maintain combat effectiveness and train both US Army and USAF personnel, it is critical that US Army air defense systems have an opportunity to conduct a portion of their training in as realistic a combat setting as possible to ensure proper training of forces.

2.6 COMPARISON OF ALTERNATIVES

With the exception of the No Action Alternative, no other alternatives were carried forward for analysis in this EA. A side-by-side comparison of the Proposed Action to the No Action Alternative is provided in Table 2-3.

Table 2-3. Comparison of Alternatives

Resource	Proposed Action	Alt A No Action
Air Quality	Short-term and minor impacts to air quality would occur resulting from vehicle and generator use and support activities such as cooking and diesel refueling.	No impacts would occur in the proposed radar/communications area.
Biological Resources	Approximately 79.8 acres of habitat would be disturbed during the proposed exercises. Although disturbance would be relatively minor and infrequent at a given site, routine use over a period of 15 years would likely degrade the sites. Most of the vegetation and wildlife located in the proposed exercise area consists of locally and regionally common species. In addition, sites have been located to avoid sensitive grazing habitat where feasible. The proposed action could result in the spread of noxious and non-native invasive weeds; however, BLM weed measures and SOPs would be implemented. Proposed activities conducted during the breeding season could impact ground-nesting birds; however, SOPs have been incorporated to minimize impacts to birds during the breeding season. No impacts to threatened or endangered plants are expected. Short-term impacts to sensitive wildlife species could occur.	No impacts would occur in the proposed radar/communications area.
Water Resources	Impacts to surface water and groundwater would be minor and short-term, and would be associated with temporary disturbance to roadways, use and storage of fuel, and use of cleaning agents. Implementation of SOPs would minimize impacts to water resources.	No impacts would occur in the proposed radar/communications area.
Soils	Minor and short-term impacts to soil surfaces would occur. Disruption of soil surfaces could lead to increased erosion at the sites; however, SOPs including reseeding disturbed areas would minimize the potential for erosion.	No impacts would occur in the proposed radar/communications area.
Land use	The proposed action would not change land use in the region. Minor impacts could occur; however, these impacts would be short-term and consistent with local land uses.	No impacts would occur.
VRM	Impacts to aesthetics would be minor and short-term, and would be consistent with BLM Class IV management objectives.	No impacts would occur in the proposed radar/communications area.
Recreation	Impacts would be short-term and minor, and would primarily occur in remote and little-used areas. The proposed action would not preclude access to recreation facilities and would have no impact on facilities in the area.	No impacts would occur in the proposed radar/communications area.
Noise	Noise impacts would be temporary and localized to primarily rural areas with few, if any, sensitive receptors. Noise produced by the proposed action would be generally low. Access routes to the LSA would be planned to avoid the majority of sensitive receptors located in the vicinity.	No impacts would occur in the proposed radar/communications area.
Socioeconomics	No impacts would occur.	No impacts would occur.

Resource	Proposed Action	Alt A No Action
Transportation	Traffic impacts would be minor and short-term and would occur during deployment, operations, and demobilization. Typical impacts include temporary additional congestion on local roadways and delays for highway travelers due to a slow-moving convoy.	No impacts would occur in the proposed radar/communications area.
Hazardous Materials and Waste Handling and Disposal	No hazardous materials have been identified in the proposed radar/communications area. Small quantities of hazardous materials would be used during the proposed action; however, a HAZMART and SOPs would be implemented.	No impacts would occur in the proposed radar/communications area.
Cultural Resources	No impacts would occur to cultural resources.	No impacts would occur in the proposed radar/communications area.
Utilities	No impacts would occur.	No impacts would occur in the proposed radar/communications area.

1

SECTION 3.0
AFFECTED ENVIRONMENT

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3.1 AIR QUALITY

This chapter describes the existing conditions in the region of the proposed exercises. These conditions provide the baseline for the assessment of environmental impacts from the proposed exercises and alternatives.

3.1.1 Existing Conditions

Climate and Factors Affecting Air Quality

The entire project area includes a large portion of Lincoln County, which is at the boundary of the northern Mojave Desert and the southern Great Basin, and Clark County within and north of the Las Vegas Valley. From spring through fall, the climate of the area is mainly influenced by Pacific air movements that come across the Sierra Nevada Mountains. Overall, due to high insolation during most of the year, the dispersion characteristics are good to fair. However, during the winter, the area can exhibit poor vertical and horizontal dispersion characteristics, which limit the dispersion of emissions and cause increased ambient air pollutant concentrations near the ground surface. Persistent surface-based temperature inversions during the cold weather months can limit vertical dispersion of air pollutants by acting as a "ceiling" that prevents pollutants from rising and dispersing. Mountain ranges can also act as "walls" that inhibit horizontal dispersion of air pollutants within valleys. Calm wind conditions, which occur during winter inversions, may also limit pollutant dispersion, particularly during nighttime and early morning hours. The dispersion characteristics of each proposed Radar/Communications site within Lincoln County will be affected by the general topography surrounding the site and the ambient conditions that occur during the proposed Radar/Communications exercises.

Monitoring stations in North Las Vegas and the Key Pittman Wildlife Management Area (WMA) were selected to represent the average climate of the southern and northern portions of the study area, respectively. The North Las Vegas weather station is located near Nellis AFB, from which the Radar/Communications exercises would be mobilized, whereas the Key Pittman WMA is located in Lincoln County in the general area of the proposed sites. Table 3.1-1 provides the monthly average high and low temperatures and the annual precipitation averages in the North Las Vegas and the Key Pittman WMA respectively.

3.1.2 Air Quality Standards

The quality of surface air is evaluated by measuring ambient concentrations of pollutants that are known to have deleterious effects. Federal and state agencies then compare the degree of air quality degradation to the established ambient air quality standards. The air pollutants that are regulated by these standards are called "criteria pollutants." The current National Ambient Air Quality Standards (NAAQS or National Standards) and State Ambient Air Quality Standards (Nevada Standards) are listed in Table 3.1-2.

Table 3.1-1. Monthly Temperature and Precipitation in the Project Area

Month	North Las Vegas						Key Pittman WMA					
	Temperature				Precipitation		Temperature				Precipitation	
	Maximum		Minimum				Maximum		Minimum			
	°F	°C	°F	°C	inch	cm	°F	°C	°F	°C	inch	cm
January	60.2	15.7	32.2	0.1	0.58	1.47	50.4	10.2	23.9	-4.5	0.63	1.60
February	64.3	17.9	35.8	2.1	0.75	1.91	57.2	14.0	28.4	-2.0	0.81	2.06
March	72.2	22.3	42.4	5.8	0.49	1.24	62.2	16.8	31.2	-0.4	0.86	2.18
April	80.7	27.1	49.3	9.6	0.19	0.48	68.6	20.3	36.1	2.3	0.69	1.75
May	90.1	32.3	57.4	14.1	0.09	0.23	80.4	26.9	44.4	6.9	0.53	1.35
June	100.4	38.0	64.9	18.3	0.08	0.20	91.2	32.9	53.0	11.7	0.29	0.74
July	105.8	41.0	71.4	21.9	0.37	0.94	96.0	35.6	59.4	15.2	0.86	2.18
August	104.3	40.2	70.8	21.6	0.29	0.74	94.1	34.5	58.9	14.9	0.72	1.83
September	97.6	36.4	62.6	17.0	0.34	0.86	85.7	29.8	51.0	10.6	0.73	1.85
October	84.5	29.2	50.2	10.1	0.26	0.66	75.2	24.0	41.6	5.3	0.52	1.32
November	68.4	20.2	37.6	3.1	0.40	1.02	60.0	15.6	30.8	-0.7	0.60	1.52
December	59.9	15.5	31.5	-0.3	0.34	0.86	53.6	12.0	25.0	-3.9	0.69	1.75
Annual*	82.4	28.0	50.5	10.3	4.19	10.64	72.9	22.7	40.3	4.6	7.94	20.17

Source: WRCC, 2004

Note: The period of record for the North Las Vegas Station is from February 1, 1951 through June 30, 2004, and the period of record for the Key Pittman WMA station is from March 1, 1964 to June 28, 1989.

*Annual average temperature or annual total precipitation.

Table 3.1-2. National and State Ambient Air Quality Standards

Pollutant	Averaging Time	Nevada Standards[1]	National Standards[2]	
		Concentrations[3]	Primary[3,4]	Secondary[3,5]
Ozone (O_3)	1-hour 8-hour	0.12 ppm (235 µg/m³) NS	 0.08 ppm (157 µg/m³)	 0.08 ppm (157 µg/m³)
Carbon Monoxide (CO)	1-hour 8-hour [7] 8-hour [8]	35 ppm (40 mg/m³) 9.0 ppm (10 mg/m³) 6.0 ppm (6.67 mg/m³)	35 ppm (40 mg/m³) 9 ppm (10 mg/m³)	NS NS
Nitrogen Dioxide (NO_2)	Annual Avg.	0.053 ppm (100 µg/m³)	0.053 ppm (100 µg/m³)	0.053 ppm (100 µg/m³)
Sulfur Dioxide (SO_2)	3-hour 24-hour Annual Avg.	0.5 ppm (1300 µg/m³) 0.04 ppm (105 µg/m³) 0.03 ppm (80 µg/m³)	NS 0.14 ppm (365 µg/m³) 0.03 ppm (80 µg/m³)	0.5 ppm (1300 µg/m³) NS NS
Respirable Particulate Matter (PM10)	24-hour Ann. Arith. Mean	150 µg/m³ 50 µg/m³	150 µg/m³	150 µg/m³
Fine Particulate Matter (PM2.5)	24-hour Ann. Arith. Mean	NS NS	35 µg/m³ 15 µg/m³	35 µg/m³ 15 µg/m³
Lead (Pb)	Calendar Qtr.	1.5 µg/m³	1.5 µg/m³	1.5 µg/m³
Hydrogen Sulfide [6]	1-hour	0.08 ppm (112 µg/m³)	NS	NS

Source: USEPA, 2007a; NDEP, 2004 and 2007; CCDAQM, 2000, 2001, 2007a, and 2007b

Notes: NS = no standard; ppm = parts per million; µg/m³ = microgram per cubic meter; mg/m³ = milligrams per cubic meter

1. Nevada Standards are values that are not to be exceeded in areas where the public has access.
2. National Standards, other than ozone, fine particulate matter (PM2.5), and those based on annual averages or annual arithmetic mean, are not to be exceeded more than once per year. The 1-hour ozone standard is attained when the expected number of days per calendar year with maximum hourly concentrations above the standard is equal to or less than one. The 8-hour ozone standard is attained when the fourth highest 8-hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM2.5, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard.
3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 mm of mercury (1,013.2 millibars). Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 mm of mercury; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.
4. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

5. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any know or anticipated adverse effects of a regulated air pollutant.
6. The Nevada ambient air quality standard for hydrogen sulfide does not include naturally occurring background concentrations.
7. Applies at elevations less than 5000 feet above mean sea level.
8. Applies at elevations equal to or greater than 5000 feet above mean sea level.

3.1.3 Monitoring Data

Indications of existing criteria pollutant levels in and around the proposed Radar/Communications sites within Lincoln County cannot readily be determined as no regulatory ambient air monitoring stations currently exist anywhere within Lincoln County. However, Lincoln County is designated as unclassifiable/attainment for all ambient air quality standards. Recent monitoring data from Clark County, located immediately south of Lincoln County and the location where convoys will convene at the beginning and end of each exercise, were obtained from the Clark County Department of Air Quality Management (CCDAQM). Two monitoring stations, one located in Las Vegas (4001 E. Sahara Road) and one in Apex Nevada, were selected to provide a general profile of the air quality near Nellis AFB (in Clark County) and along the main access road heading to the northern project area. The Mesquite Nevada station was selected to provide a general profile of the air quality north of the Las Vegas Valley, which would be more similar to Lincoln County where the majority of ADA activities would be occurring. Ozone (O_3), nitrogen dioxide (NO_2), particulate matter 10 microns and under (PM10), and particulate matter 2.5 microns and under (PM2.5) are monitored at the Apex station, and carbon monoxide (CO) and sulfur dioxide (SO_2) are monitored at the 4001 E. Sahara Road station. Only ozone, NO_2, and PM10 are monitored at the Mesquite station. Table 3.1-3 provides the monitoring data collected from the subject monitoring stations from 2004 to 2006.

Table 3.1-3. Ambient Air Quality Summary

Pollutant	Apex/Las Vegas			Mesquite[1]		
	2004	2005	2006	2004	2005	2006
Ozone (1-Hour)						
Max. Concentration (ppm)	0.097	0.114	0.097	0.088	0.106	0.077
Days>NAAQS (0.125 ppm)	0	0	0	0	0	0
Ozone (8-Hour)						
Max. Concentration (ppm)	0.085	0.098	0.083	0.081	0.092	0.072
Days>NAAQS (0.085 ppm)	0	2	0	0	1	0
CO (1-Hour)						
Max. Concentration (ppm)	5.6	5.1	5.5	NA	NA	NA
CO (8-Hour)						
Max. Concentration (ppm)	5.2	4.6	4.5	NA	NA	NA
NO_2 (Annual)						
Annual Concentration (ppm)	0.005	0.006	0.005	0.007	0.007	0.007
PM10 (24-Hour)[2]						
Maximum Concentration ($\mu g/m^3$)	150	97	152	134	316	145
Days > NAAQS (150 $\mu g/m^3$)	0/339	0/340	0/344	0/334	1/330	0/338
PM10 (Annual)						
Annual Concentration ($\mu g/m^3$)	19	18	18	22	26	24
PM2.5 (24-Hour)						
Max. Concentration ($\mu g/m^3$)	9	12	11	NA	NA	NA
PM2.5 (Annual)						
Annual Concentration ($\mu g/m^3$)	4.0	4.1	3.9	NA	NA	NA

Pollutant	Apex/Las Vegas			Mesquite[1]		
	2004	2005	2006	2004	2005	2006
SO_2 (1-Hour) Max. Concentration (ppm)	0.013	0.024	0.015	NA	NA	NA
SO_2 (3-Hour) Max. Concentration (ppm)	0.007	0.013	0.009	NA	NA	NA
SO_2 (24-Hour) Max. Concentration (ppm)	0.002	0.006	0.002	NA	NA	NA

Source: USEPA, 2007b.
Notes: ppm=parts per million; $\mu g/m^3$=micrograms per cubic meter; NAAQS=National Ambient Air Quality Standard; NA=not available.
1. Apex station data for NO_2 and SO_2, data otherwise from North Las Vegas station.
2. "Days" for PM10 are given as exceedances/number of annual measurements

During the three-year period for the Apex and Las Vegas station monitoring data, there were a couple of recorded exceedances of the 8-hour ozone standard. During the same period for the Mesquite station, there was one recorded exceedance of the 8-hour ozone standard and one recorded exceedance of the 24-hour PM10 standard. The air quality in the remote areas for the proposed Radar/Communications sites in Lincoln County would be expected to be significantly better than that measured in Clark County.

3.1.4 Air Quality Attainment Status

Non-attainment is a term used to indicate violations of an air quality standard (Table 3.1-2). A summary of the air quality status in Lincoln and Clark Counties relative to meeting the NAAQS is provided in Table 3.1-4. As shown in Table 3.1-4, air quality in Lincoln County and the northern portion of Clark County adjacent to Lincoln County are designated as unclassifiable/attainment for all criteria pollutants. The air quality for the Las Vegas portion of Clark County, including the portions of Nellis AFB that would be used for ADA activity mobilization, is designated as serious nonattainment for both the CO and PM10 NAAQS and basic non-attainment for the 8-hour ozone NAAQS.

Table 3.1-4. Attainment Status of the Study Area

Pollutant	Lincoln County and Clark County (North of Las Vegas)	Clark County (Las Vegas Area)
Ozone 1-hour	Unclassifiable/Attainment	Unclassifiable/Attainment
Ozone 8-hour	Unclassifiable/Attainment	Basic Nonattainment
CO	Unclassifiable/Attainment	Serious Nonattainment
PM10	Unclassifiable/Attainment	Serious Nonattainment
NO_2, SO_2, & PM2.5	Unclassifiable/Attainment	Unclassifiable/Attainment

Source: USEPA, 2007c.

The General Conformity Rule (40 CFR Part 93, Subpart B) addresses both non-attainment areas and maintenance areas (former non-attainment areas now in attainment). Lincoln County and Clark County, north of the Las Vegas nonattainment area, are neither non-attainment areas nor maintenance areas for any criteria pollutants, so General Conformity does not apply to those areas. However, the Las Vegas area of Clark County is designated as a serious non-attainment area for PM10, a serious non-attainment area for CO, and a basic non-attainment area for ozone (8-hour standard).

While the Las Vegas area is still designated as a serious CO nonattainment area there has not been a violation of the CO NAAQS since 1998 and the Las Vegas area may be designated as a CO maintenance area after a CO maintenance plan is submitted by CCDAQM and approved by the United States Environmental Protection Agency (USEPA).

3.2 BIOLOGICAL RESOURCES

This section describes the current biological conditions observed in the proposed Radar/Communications activity area. A detailed description of the biological setting for the project area is described in the Environmental Assessment for the Joint Red Flag '05 ADA activities completed in 2005 (USAF, 2005).

3.2.1 Existing Conditions

The proposed Radar/Communications area is located in the transition zone between the northern Mojave Desert and the southern Great Basin Desert. Although a small portion of the Radar/Communications activity area has characteristics of the Mojave Desert, most of the vegetation is characteristic of the Great Basin Desert.

3.2.2 Vegetation

The proposed Radar/Communications exercises would be located in an area that encompasses approximately 2.5 million acres of land which occur in the transitional zone between the Mojave Desert and Great Basin biogeographic provinces. Plant communities in this region are characterized by Mojave Desert Scrub and Great Basin Desert Scrub biomes (Brown, 1994). For most of the region, the availability of water or soil moisture is the critical factor that determines the distribution of vegetation types and associated wildlife species. A description of the dominant plant communities located in the region is provided below.

Mojave Desert Scrub Biome

Mojave Desert Scrub communities occur to a limited extent near the community of Alamo, adjacent to the proposed LSA. This region is the most northern extent of the Mojave Basin biogeographic province and is dominated by creosote bush (*Larrea tridentata*), white bursage (*Ambrosia dumosa*), range ratany (*Krameria erecta*), cheesebush (*Hymenoclea salsola*), Mormon tea (*Ephedra* spp.), and spiny menodora (*Menodora spinescens*). Four-wing saltbrush (*Atriplex canescens*), joint-fir (*E.nevadensis*), budsage (*A. spinescens*), and Joshua tree (*Yucca brevifolia*) are other common elements observed in these communities. Cacti are also well represented region wide and include silver cholla (*Opuntia echinocarpa*), old man cactus (*O. erinacea*), and beavertail (*O. basilaris*). Strawberry hedgehog cactus (*Echinocereus engelmannii*) is also present but to a limited extent.

Herbaceous annual species identified in the proposed Radar/Communications activity area include desert mallow (*Sphaeralcea ambigua*), desert trumpet (*Eriogonum inflatum*), Mojave buckwheat (*E. fasciculatum*), Mojave aster (*Xylorhiza tortifolia*), blue flax (*Linum perenne*), and prince's plume (*Stanleya pinnata*). Native perennial grasses, including Indian rice grass (*Oryzopsis hymenoides*), big

galletta (*Hilaria rigida*), and fluffgrass (*Erioneuron pulchellum*) are also present. Non-native grasses and invasive herbaceous plants occur adjacent to the LSA and include cheatgrass (*Bromus tectorum*) and red brome (*B. madritensis ssp. rubens*). Other invasive species including halogeton (*Halogeton glomeratus*), Russian thistle (*Salsola tragus*), and tansy mustard (*Descurania* spp.) are common elements along disturbed roadsides and grazed areas in this region.

Great Basin Desert Scrub

Great Basin Desert Scrub evolved from both cold-temperate and warm-temperate vegetation and is characterized by communities dominated by sagebrush (*Artemisia* spp.), shadscale (*A. confertifolia*), or winterfat (*Krascheninnikovia lanata*) (Brown, 1994). Blackbrush (*Coleogyne ramosissima*), greasewood (*Sarcobatus vermiculatus*), black sage (*A. nova*), and rabbitbrush (*Chrysothamnus* spp.) are also common and are often co-dominant or present in many Great Basin plant communities.

Vegetation located on the lower elevations of the valley and basin floors is characterized by monocultures of halophytic (salt-tolerant) shrubs including spiny hopsage (*Grayia spinosa*), four-wing saltbush, and winterfat. Where soils are especially alkaline and clay-rich, as on the margins of dry lake beds (e.g., Coal Valley, Sand Springs Valley, and Dry Lake Valley), saltbush species including four-wing saltbush and shadscale dominate the vegetation. Saltbush communities, especially near playas, may consist exclusively of these species. Other common species observed in this area include rubber rabbitbrush (*C. nauseosus*), sticky rabbitbrush (*C. paniculatus*) or sticky-leaved rabbitbrush (*C. viscidiflorus*), and snakeweed (*Gutierrezia sarothrae*). Because of the timing of the surveys, few herbaceous or graminoid species were observed, but those present included big galletta grass, red three-awn (*Aristada glauca*), Indian rice grass, Utah penstemon (*Penstemon utahensis*), and bristly gilia (*Langloisia setosissima*). Other less common species include scarlet gaura (*Gaura coccinea*), Townsend daisy (*Townsendia* spp.), and an unidentified milkvetch (*Astragalus* spp).

In the more northern sections of Sand Springs Valley the habitat transitions to Great Basin sagebrush, particularly near Radar/Communication site 112C. Intermediate elevation slopes located along the periphery of the dry lakes are dominated by Great Basin mixed desert scrub characterized by rabbitbrush, hopsage, winterfat, budsage, and blackbrush. In some areas range ratany and white bursage co-dominate with four-wing saltbush. Near U.S. Highway 93 at the Pahroc summit pass, Mojave Desert Scrub intergrades with Basin communities and supports small components of Joshua tree, banana yucca (*Y. baccata*), and beavertail cactus. Desert needlegrass (*Stipa speciosa*), Indian ricegrass, big galletta, and fluff grass occur in open spaces between the shrubs.

Non-woody range weeds like halogeton, Russian thistle, and non-native grasses including cheatgrass and red brome are locally abundant on disturbed sites and commonly occur in this area (USAF, 2001).

Wilderness Areas and Areas of Critical Environmental Concern

Several Wilderness Areas are located in the general region of the proposed Radar/Communications activity area, and include the Worthington Mountains, Weepah Springs, Big Rocks, Ash Springs Wildlife Area, Desert National Wildlife Range, Key Pittman WMA, Pahranagat National Wildlife

Refuge, and Humboldt-Toiyabe National Forest. Wilderness Areas are managed to remain in their natural condition. Passive recreation such as hiking is allowed in Wilderness Areas, but motorized vehicle access is prohibited. Project activities would not occur in any designated Wilderness Area. Similarly, the exercises would be limited to previously disturbed sites within rangeland and would not occur in any area designated as an Area of Critical Environmental Concern.

Vegetation at Radar/Communications Sites

To verify the conditions at each of the proposed Radar/Communications sites, biological surveys were conducted at each site on 29-31 October 2007, 5-7 November, and 6 December 2007. A review of Natural Resources Conservation Service (NRCS) soil types was also conducted to evaluate the potential for the presence of sensitive vegetation. Table 3.2-1 identifies the existing biological conditions that occur on each of the proposed Radar/Communications sites.

Each of the Radar/Communications site were selected in areas that had been subject to previous levels disturbance. For example, some of the proposed Radar/Communications areas contain little or no vegetation or have been subject to periodic disturbance from grazing activities and off-road vehicle use. At two locations, the proposed sites would be located at existing dirt airfields. Due to the timing of the surveys (October through December 2007), the floristic period for many plant species, and the low levels of rainfall experienced in the region (Annual average rainfall is 6.6 inches based on Alamo, NV – weather.com) it is likely that some annual plants potentially present at the proposed Radar/Communications sites were not observed. However, much of the region consists of rangeland which is routinely subject to grazing by livestock (*Bos taurus*) and wild horses (*Equus caballus*).

Table 3.2-1. Site Description at Proposed Radar/Communications Sites.

ADA Site	Location	Land Type	Land Cover Characteristics
LSA	Alamo Airfield ca. 1 mile west of the community of Alamo	Barren, dirt airfield	Site would be located on the improved dirt airfield. Existing runway is approximately 1 mile long and 0.1 mile in width. Surrounding habitat is characterized as Mojave scrub.
109	Six Mile Flat west of Pahroc Summit Pass	Blackbrush	Scrubland dominated by blackbrush, white bursage, four-wing saltbush and range ratany. No recent evidence of grazing. Creosote bush and elements of big sage brush also present. Beavertail, silver cholla, and old man cactus present.
108	Delamar Valley ca. 1 mile south of Highway 93	Disturbed grassland, dirt airfield	Located on the south end of a dirt airfield. Activities would occur within the fenced section of the site. Adjacent habitat appears to be subject to periodic mowing and grazing. Dominant species include red three-awn, desert needle grass, and rubber rabbitbrush. Indian rice grass, big galletta grass, and Russian thistle common.
102	Delamar Valley ca. 3 miles south of Highway 93	Disturbed rabbitbrush and playa	Area located near livestock water site. Many areas lack vegetation. Dominant vegetation includes disturbed rabbitbrush community, budsage, Indian rice grass, and snakeweed. Russian thistle common. Joshua trees and winterfat present to a limited extent.
103	Dry Lake Valley ca. 9 miles north of Highway 93	Disturbed Salt Desert Scrub	Evidence of historic grazing. Site dominated by Russian thistle, rabbitbrush, and cheat grass. Other species include mallow, Indian rice grass, and big galletta.
110G	Coal Valley ca. 10 miles north west of Highway 93	Disturbed Salt Desert Scrub	Area located near old borrow pit. Site dominated by Russian thistle and brome grass. Shadscale, winterfat, globe mallow, rabbitbrush, and Indian rice grass locally dense in some areas.
110E	Coal Valley ca. 13 miles north west of Highway 93	Blackbrush	Area located near livestock water site. Subject to grazing. Common species include blackbrush, snakeweed, ephedra, cheat grass, and rabbitbrush. Mojave prickly pear and silver cholla are also present.

ADA Site	Location	Land Type	Land Cover Characteristics
110F	Coal Valley ca. 22 miles north west of Highway 93	Disturbed Salt Desert Scrub	Area located near livestock water site. Subject to grazing. Common species include Russian thistle, winterfat, and four-wing Saltbush. The stalks of several grass were also present that had been subject to recent grazing.
112I	Sand Springs Valley ca. 1 mile north of State Route 375	Disturbed Salt Desert Scrub	Area subject to cattle grazing. Exotics common in some areas including Russian thistle and brome grasses. Shrubs common and include, blackbrush, shadscale, winterfat, and rabbitbrush. Silver cholla and Mojave prickly pear cactus also present.
112H	Sand Springs Valley ca. 7 miles northeast of State Route 375	Disturbed Salt Desert Scrub	The site was moderately grazed with denser vegetation and basalt rock type soil. Common species include blackbrush, shadscale, winterfat, snakeweed, ephedra, and rabbitbrush. Four-wing salt bush, rayless encilia, and cheesebush also present. Grasses included big galletta, Indian rice grass, and various bromes. An unidentifiable milkvetch without flowers or seed pods was also noted.
112G	Sand Springs Valley ca. 11 miles north of State Route 375	Disturbed Salt Desert Scrub	Area subject to cattle grazing and occurs next to watering area. Exotics common in some areas and the site appears to have been subject to OHV use. Russian thistle and unidentified grazed grasses present. Shrubs include four-wing saltbush and winterfat.
112F	Sand Springs Valley ca. 16 miles northeast of State Route 375	Disturbed Salt Desert Scrub	Site located next to livestock water site. Portions of this site are heavily grazed as evidenced by copious cattle scat and short denuded vegetation. Dominant vegetation where present included Russian thistle four-wing salt bush, and rabbitbrush. Winterfat, Townsend daisy rosette and, globe mallow were also present. Several grasses were present including cheat grass, Indian rice grass and big galletta.
112E	Sand Springs Valley ca. 18 miles northeast of State Route 375	Disturbed Salt Desert Scrub	Site located next to livestock water site. Portions of this site are heavily grazed and dominated by exotics. Russian thistle and brome grasses common. Some of the shrubs present at the site included winterfat, rabbitbrush, four-wing salt bush, big sagebrush, and sweet bush. Grasses included Desert needle grass, brome grasses, Indian rice grass and big galletta. Forbs present included rattlesnake weed and globe mallow. Mojave prickly pear was also present in some areas
112C	Sand Springs Valley ca. 21 miles northeast of State Route 375	Big Basin Sagebrush	This area was dominated by large areas of basin sagebrush. Other shrubs common to this site included ephedra, shadscale, four-wing saltbush, and rabbitbrush. Russian thistle and brome grasses were also noted. Several unidentified milkvetch were observed on this site.

Soil conditions at the Radar/Communications sites vary and the representative vegetation communities are linked to the soils that occur at the site. As described above, the Radar/Communications site were selected based on the pre-existing level of disturbance and the condition of the Radar/Communications sites does not represent the condition of the surrounding areas. Soil series can be correlated to vegetation communities, and based on the soils present at each site, vegetation that would occur in the absence of marked disturbance can be determined. Table 3.2-2 contains a list of the soil types and corresponding vegetation that would be expected to occur at each Radar/Communications site in the absence of disturbance (NRCS, 2008).

Table 3.2-2. NRCS Soil Type and Dominant Vegetation Expected to Occur

Site	Soil Series	Erosion Potential	Dominant Plant Species Expected to Occur	
LSA	Alko-Arizo Association	No information	Shadscale Indian ricegrass Big galleta Bud sagebrush	Ephedra White bursage Desert needlegrass
112I	Aysees gravelly sandy loam, 2-4% slopes	No information	Indian ricegrass Shadscale Bud sagebrush	Winterfat Bottlebrush squirreltail Galleta
112G	Penoyer silt loam, slightly saline, sodic	No information	Alkali sacaton Basin wildrye Baltic rush Black greasewood	Rabbitbrush Baltic rush Inland saltgrass
112F	Cliffdown gravelly sandy loam, 0-2 % slopes	No information	Indian ricegrass Fourwing saltbush Sand dropseed	Winterfat Needleandthread
112E	Crystal Springs-Cliffdown association, 2-4% slopes	No information Likely moderate	Indian ricegrass Spiny hopsage Fourwing saltbush Bud sagebrush	Anderson's wolfberry Winterfat Galleta Nevada ephedra
112C	Lojet-Littleailie association	Slight to moderate	Indian ricegrass Wyoming big sagebrush Needleandthread	Fourwing saltbush Utah juniper Desert needlegrass
110G	Glotrain-Koyen Association	Slight	Indian ricegrass Shadscale Bud sagebrush	Galleta Bottlebrush squirreltail Winterfat
110E	Leo-Tybo Association	Slight to moderate	Indian ricegrass Spiny hopsage Desert needlegrass Bush muhly Fourwing saltbush	Nevada ephedra Winterfat Bud sagebrush Galleta
110F	Koyen sand, 2-8% slopes	Slight to moderate	Indian ricegrass Fourwing saltbush Winterfat Galleta	Bottlebrush squirreltail Bud sagebrush Globemallow Spiny hopsage
109	Tybo-Koyen association	Slight to moderate	Indian ricegrass Spiny hopsage Desert needlegrass Bush muhly Fourwing saltbush	Nevada ephedra Winterfat Bud sagebrush Galleta
108	Tybo-Koyen Association	Slight to moderate	Indian ricegrass Spiny hopsage Desert needlegrass Bush muhly Fourwing saltbush	Nevada ephedra Winterfat Bud sagebrush Galleta
102	Geer-Penoyer Association and Koyen gravelly sandy loam, 2-4% slope	Slight	Indian ricegrass Winterfat Bud sagebruss	Bottlebrush squirreltail Fourwing saltbush Galleta
112H	Silent-Koyen association	Slight to moderate	Indian ricegrass Shadscale Bud sagebrush	Galleta Bottlebrush squirreltail Winterfat
103	Koyen-Geer	Slight	Indian ricegrass Fourwing saltbush Winterfat Galleta	Bottlebrush squirreltail Bud sagebrush Globemallow Spiny hopsage

Source: NRCS, 2008

3.2.3 Noxious and Non-native Invasive Weeds

Noxious weeds pose a threat to the natural processes of plant community succession, fire frequency, biological diversity and species composition. The survival of some populations of special-status species

could be adversely affected by the success of an introduced plant species. In areas subject to wildfires, exotic plants can quickly out-compete natives and change the ecology of the system. Noxious weeds present a severe threat to natural habitats. Monocultures of noxious weeds can create an unfavorable environment for wildlife that is necessary for native plant life cycles, such as seed dispersers, fossorial mammals, or pollinators. Heavy infestations can also significantly reduce the recreational or aesthetic value of open space.

Non-native vegetation, including noxious and invasive weeds, is a common occurrence in many sections of the Great Basin. This is particularly evident along the road margins and urban-rural interface areas where Russian thistle and exotic grasses are common. These areas are typically subject to higher levels of disturbance from routine road grading, parking, OHV use, and grazing, which may increase the potential for the spread of invasive plant species. Weed surveys were not conducted for the proposed Radar/Communications sites, but an inventory of noxious and non-native weeds has been conducted for sections of the proposed activity area. The BLM identified several populations of noxious weeds in the project region including populations of spotted knapweed (*Centaurea stoebe*), tall whitetop (*Lepidium latifolium*), and hoary cress (*L. draba*). Brome grasses and other herbaceous weeds are also common and include cheatgrass, red brome (*B. rubens*), bull thistle (*Cirsium vulgare*), Scotch thistle (*Onopordum acanthium*), and halogeton (*Halogeton glomerus*) (BLM, 2007b).

Populations of noxious and non-native weeds would be identified and avoided during the proposed Radar/Communications activities.

3.2.4 Wildlife

Great Basin vegetation communities can support a wide variety of wildlife species and the surrounding habitat provides use for foraging, nesting/ burrowing, and wildlife movement. Wildlife observed within the project area included a variety of common birds, mammals, and reptiles.

Birds

Birds were the most common vertebrates observed in the project area. Bird species were identified by sight and sound during the survey period. Some of the bird species observed during the survey included common raven (*Corvus corax*), night hawk (*Chordeiles minor*), Gambel's quail (*Callipepla gambelii*), mourning dove (*Zenaida macroura*), and horned lark (*Eremophila alpestris*). Several raptors were also observed in the valleys and included red-tailed hawk (*Buteo jamaicensis*) and rough-legged hawk (*Buteo lagopus*). Although not observed, there is potential for burrowing owl (*Athene cunicularia*) to be present in the area, and a possible burrow was observed adjacent to one of the proposed Radar/Communications sites in the Sand Springs Valley.

Mammals

Several large mammals were observed during the surveys and are expected to occur within the proposed exercise area. These include mule deer (*Odocoileus hemionus*), pronghorn antelope (*Antilocapra americana*), cattle, and wild horses. Other mammals observed in the proposed Radar/Communications activity area include coyote (*Canis latrans*), desert cottontail rabbit (*Sylvilagus audubonii*), antelope

squirrels (*Ammospermophilus* sp.), and black-tailed jackrabbits (*Lepus californicus*). Small rodent burrows were common and were present to some degree at most of the proposed sites. Due to the isolated location, mountain lion (*Felis concolor*), and bobcat (*F. rufus*) could also utilize the project area. Other common species expected to occur include badger (*Taxidea taxus*), kangaroo rats (*Dipodmys* ssp.), and at higher elevations, desert bighorn sheep (*Ovis canadensis*) and elk (*Cervus canadensis*). Populations of bighorn sheep are known to occur in the adjacent Pahranagat Range, the Sheep Range, and the Delamar Mountains, and were observed in the region. However, these species are not expected to occur in or adjacent to the proposed Radar/Communications sites (USAF, 2001).

Amphibians

Amphibians often require a source of standing or flowing water to complete their life cycle. However, some terrestrial species can survive in drier areas by remaining in moist environments found beneath leaf litter and fallen logs, or by burrowing into the soil. These xeric-adapted species conserve moisture by emerging only under conditions of high humidity or when the weather is cool and/or wet. The project area provides poor habitat for amphibians and this group of animals is not expected to occur at the proposed Radar/Communications sites.

Reptiles

Although a number of common reptile species may occur within the proposed project area, only side-blotched lizards *(Uta stansburiana)* were observed during the surveys. Basin rattlesnake (*Crotalus viridis lutosus*), gopher snake (*Pituophis melanoleucus*), and western whiptails (*Aspidoscelis tigris*) are common species likely present in the project region.

Native Fish

Fish were not observed in the project area and the proposed Radar/Communication sites do not contain a perennial water source.

Wild Horses

Wild horses and burros (*E. assinus*) were released by ranchers, miners, and others over the past 100 years, and are now common rangeland species in the western United States, and particularly in Nevada (Slade and Godfrey, 1982). Wild horses and burros are protected under Public Law 92-195, the Wild Free-Roaming Horse and Burro Act of 1971. Under this act, the BLM and United States Forest Service (USFS) are charged with managing and protecting these animals.

Several wild horse Herd Management Areas (HMA) occur in the region, as shown on Figure 3.2-1. From north to south, these include the Coal Valley, Dry Lake Valley, Seamans, Rattlesnake, and Delamar Mountains (BLM, 2005). Several wild horses were observed ranging in the southern section of the Coal Valley during the October surveys. Two of the proposed Radar/Communications sites (110F and 110E) are located in a designated HMA (Figure 3.2-1).

Migratory Birds

The potential exists for migratory birds to occur within the project areas. However, the SOPs require compliance with the Migratory Bird Treaty Act. The Pahranagat Valley and associated upland areas provide important habitat for a variety of migratory birds utilizing the western flyway. Riparian and scrub communities provide shade, resting areas, protection from predators, and foraging, nesting, and breeding habitat. However, the exercises would not occur in or adjacent to riparian habitat or their adjacent uplands.

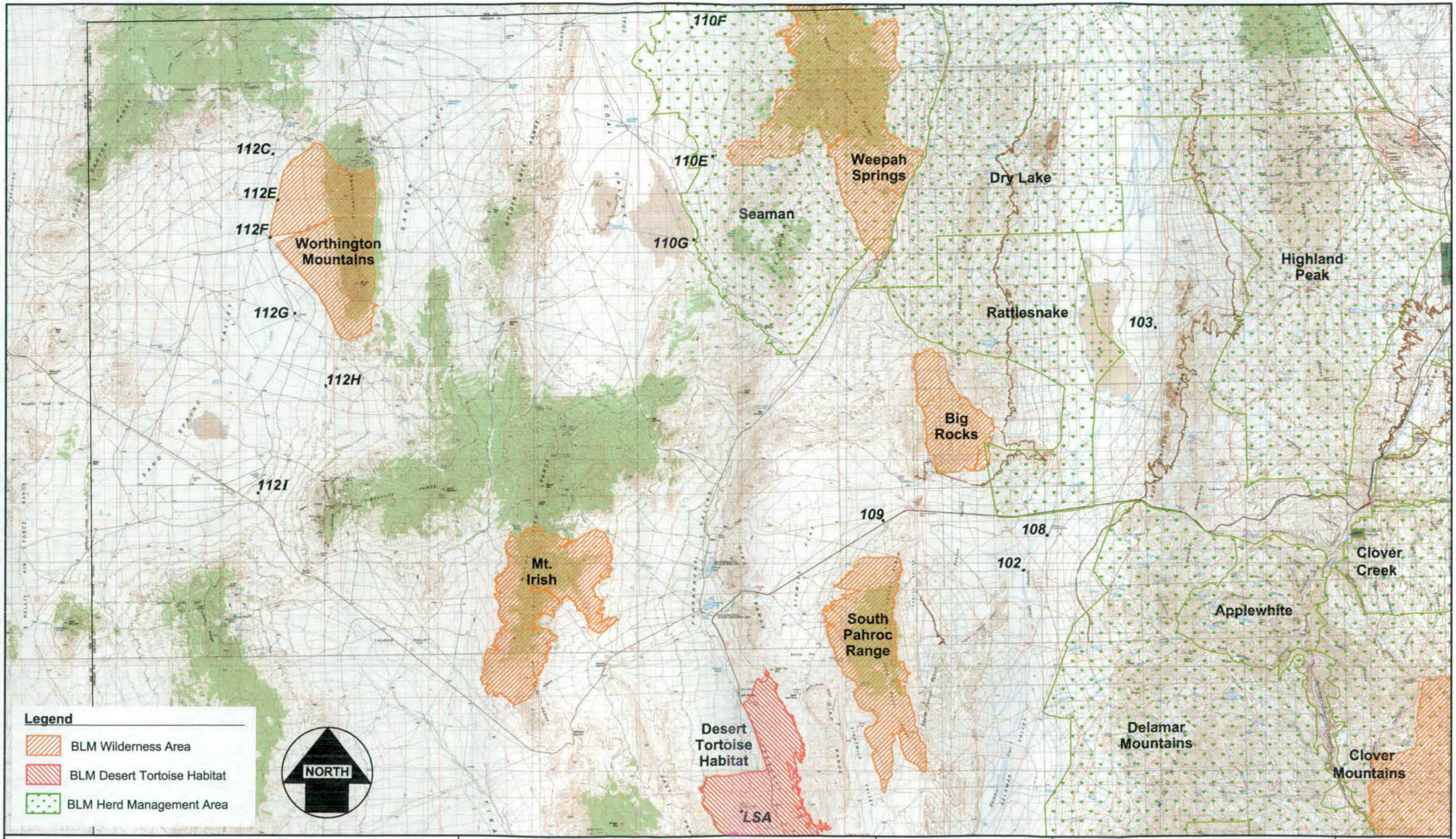
3.2.5 Sensitive Species

Special status species include those listed as threatened or endangered under the Federal Endangered Species Act (ESA), species proposed for listing, species of special concern, and other species identified either by the USFWS, BLM, or Nevada Department of Wildlife as unique or rare, and which have the potential to occur in the vicinity of the proposed Project. Nevada BLM Sensitive Species are species designated by the State Director, in cooperation with the Nevada Department of Conservation and Natural Resources, that are not already federally listed, proposed, or candidate species, or state listed because of potential endangerment. BLM's policy is to "ensure that actions authorized, funded, or carried out do not contribute to the need to list any of these species as threatened or endangered."

The USFWS identified eight federally endangered, threatened, or proposed species that may occur in the region of the proposed action. These species, including their status, habitat requirements, and potential to occur within the study area are presented in Table 3.2-2 (Vegetation) and Table 3.2-3 (Wildlife). This information is consistent with the sensitive species list developed for the Renewal of the Nellis Air Force Land Withdrawal Legislative Environmental Impact Statement (EIS) (USAF, 1999) and Nellis Air Force Base Natural Resources Integrated Management Plan (USAF, 2001). The following sections summarize species that have been observed or are expected to occur in areas affected by the proposed exercises.

3.2.5.1 Threatened and/or Endangered or Sensitive Species

A large number of special status plants have the potential to occur region wide; however, only nine sensitive plant species have been identified as occurring in this section of the MOA and with the potential to occur at any of the proposed Radar/Communications sites (USAF, 1999). These are listed in Table 3.2-3 and include: Eastwood milkweed (*Asclepias eastwoodiana*), rock purpusia (*Ivesia arizonica* var. *saxosa*), Merriam's bearpoppy (*Arctomecon merriami*), Ackerman milkvetch (*Astragalus ackermanii*), Peck Station milkvetch (*Astragalus eurylobus*), Beatley's phacelia (*Phacelia*



		Scale: 1" = 27,500' Date: February 29, 2008 File: 1118-4nellisafbpt4.dwg	**Radar/Communications Site Locations and Sensitive Resources**	**Figure 3.2-1**

beatleyae), wax flower (*Jamesia tetrapetala*), Parish's phacelia (*Phacelia parishii*), and pygmy pore leaf (*Porophyllum pygmaeum*). Threatened or endangered plant species were not observed or identified at any of the proposed Radar/Communications sites.

Table 3.2-3. Special Status Plants with the Potential to Occur in the Proposed Exercise Area

Common Name *Scientific Name*	Status Federal/ State	Associated Habitats	Potential for Occurrence
Eastwood milkweed *Asclepias eastwoodiana*	SOC, BLM	Alkaline clay hills, gravelly drainages, and shadscale scrub (5,300-6,900)	Could occur in adjacent habitat, suitable habitat present, not observed during surveys.
Rock purpusia *Ivesia arizonica* var. *saxosa*	BLM	Crevices of cliffs and, upper mixed-shrub, sagebrush, and pinyon-juniper zones.	Low, suitable habitat present in areas subject to disturbance, not observed during surveys.
Merriam's bearpoppy *Arctomecon merriamii*	SOC, BLM	Gravelly soils, limestone outcrops, playas, and Mojave scrub communities	Low, not observed during surveys
Ackerman milkvetch *Astragalus ackermanii*	SOC	Ledges and crevices of limestone cliffs	Low, habitat not present, not observed during surveys
Peck Station milkvetch *Astragalus eurylobus*	SOC, BLM	Generally deep, barren, sandy, gravelly, or clay soils derived from sandstone or siliceous volcanic material, frequently in or along drainages.	Low, not observed during surveys, project not within range of species.
Beatley's phacelia *Phacelia beatleyae*	SOC, BLM	Washes, canyons, and slopes of creosote and shadscale scrub.	Could occur, not observed during surveys
Wax flower *Jamesia tetrapetala*	SOC, BLM	Pinyon-juniper forests.	Low, habitat not present on site, not observed during surveys
Parish's phacelia *Phacelia parishii*	SOC, BLM	Playa's shadescale scrub	Could occur, not observed during surveys
Pygmy pore leaf *Porophyllum pygmaeum*	SOC, BLM	Dry, open, rocky carbonate soils of alluvial fans and hillsides, often in slight depressions, low benches adjacent to minor drainages, or other moisture-enhanced microsites, in blackbrush, mixed-shrub, and lower pinyon-juniper zones.	Could occur, not observed during surveys
Federal Status FC = Candidate for listing BLM = BLM Sensitive species		**State** CE = critically endangered SOC = NDOW sensitive	

3.2.5.2 Wildlife

There are several sensitive species that either occur or have the potential to occur within the proposed Radar/Communication activity area. However, many of these species occur in areas that would not be utilized during the proposed exercises (riverine, wetland, mountain areas) and therefore are not discussed in detail in this document. Table 3.2-4 describes the occurrence, relative distance, and potential impacts from the proposed project for these species. Only one federally listed species has the potential to be either closely associated with the proposed Radar/Communications sites or could be potentially affected by implementation of the proposed exercises and, therefore, warrant further discussion. This species is the desert tortoise (*Gopherus agassizii*), a federal and state threatened animal that occurs in the region of the LSA near the community of Alamo.

1 **Table 3.2-4. Special Status Wildlife Species with the Potential to Occur in the**
2 **Proposed Exercise Area**

Common Name Scientific Name	Status	Habitat Type	Known or Potential Occurrence in the Proposed Exercise Area
Fish			
White River spring fish *Crenichthys baileyi baileyi*	FE NDOW=P, E NNHP=S1	Desert springs	Known to occur in the Pahranagat Valley. No habitat occurs near any site.
Hiko White River Springfish *Crenichthys baileyi grandis*	FE NDOW=P, E NNHP=S1	Desert springs and drainages.	Known to occur in the Pahranagat Valley. No habitat occurs near any site.
Pahranagat Roundtail Chub *Gila robusta jordani*	FE SE NDOW=P, E NNHP=S1	Desert springs and drainages.	Under MOA airspace, in Ash Spring outflow in Pahranagat Valley, Lincoln Co. No habitat occurs near any site.
Big Spring Spinedace *Lepidoma mollispinis pratensis*	FT SP NDOW=P, T NNHP=S1	Desert springs and drainages.	Under MOA airspace, near Panaca in Coyote Canyon, Meadow Valley Wash drainage, in Pahranagat Valley, Lincoln Co. No habitat occurs near any site.
Mormon White River Springfish *Crenichthys baileyi thermophilus*	BLM	Desert springs and drainages.	Under MOA airspace, in White River-Pahranagat Valley, Lincoln Co. No habitat occurs near any site.
Reptiles			
Desert tortoise *Gopherus agassizii*	FT ST	Desert Scrub Communities	Potential to occur in southern section of exercise activity region, known to occur between Alamo and Ash Springs. Protocol surveys conducted at the LSA in 2005 did not detect the presence of this species. Habitat at LSA does not provide primary constituent elements for this species.
Chuckwalla *Sauromalus obesus*	BLM	Rocky hillsides, boulders in Mojave scrub communities	Low potential. Could occur south of proposed exercise area.
Banded Gila monster *Heloderma suspectum cinctum*	ST BLM	Mojave desert scrub communities, rocky hills and washes	Low potential. Sites not located in suitable habitat. Extreme northern range of this species. Few recorded sightings of this species.
Birds			
Golden eagle *Aquila chrysaetos*	NNHP=S4 BLM	Open terrain with grassland, pasture, sage scrub, and open woodland; as well as lakes and rivers.	Could occur. Species known to be present in the region. Nesting habitat not present at any site.
Southwestern willow flycatcher *Empidonax traillii extimus*	FE SP NDOW=P, E NNHP=S1B	Obligate riparian species that breeds along rivers, streams, wetlands, and other aquatic-associated habitats.	Potential habitat for this species occurs in the Pahranagat Valley and the Pahranagat National Wildlife refuge. No habitat occurs within 2 miles of any site.
Western least bittern *Ixobrychus exilis hesperis*	NNHP=S2N BLM	Marshes, seeps, riparian communities., and salt marsh	Observed in wetlands of Pahranagat Valley. Not expected to occur near any Radar/Communications site.
White-faced ibis *Plegadis chihi*	NNHP=S3B	Marshes, seeps, riparian communities and salt marsh. Nests on floating reeds.	Observed in wetlands of Pahranagat Valley. Not expected to occur near any site.

Common Name Scientific Name	Status	Habitat Type	Known or Potential Occurrence in the Proposed Exercise Area
Northern goshawk *Accipiter gentilis*	NDOW=P, S NNHP=S3 BLM	Alpine forests of old growth trees.	Spring and fall migrant in low numbers. Not expected to occur near any site.
Phainopepla *Phainopepla nitens*	SP NNHP=S2B BLM	Scrub communities close to permanent water.	A permanent resident of Mojave Desert scrub and desert spring habitats. Observed on NTTR. Not expected to occur near any Radar/Communications sites. Suitable habitat not present.
Ferruginous hawk *Buteo regalis*	NNHP=S3 BLM	Scrub habitats, sagebrush and open grasslands. Nests on rock pillars or ground.	This species is known to occur in the Coal Valley. Not observed during biological surveys but could be present.
Burrowing owl *Athene cunicularia*	SP NNHP=S3B BLM	Disturbed habitats, sage steppes, shrub land and grassland.	Potential to occur in the Radar/Communications activity area. Not observed during surveys however, several burrows lacking sign could be utilized by this species were identified in the Sand Springs Valley.
Western yellow-billed cuckoo *Coccyzus americanus occidentalis*	SP NNHP=S1B	Floodplain riparian forests. Prefers nesting habitat consisting of cottonwood willow riparian forest.	Potential habitat for this species occurs in the Pahranagat Valley and the Pahranagat National Wildlife refuge. No habitat occurs within 2 miles of the Radar/Communications activity area.
Black tern *Chlidonias niger*	NNHP=S2S33B BLM	Wetlands, marshes and riparian communities.	Observed at wetlands in Pahranagat Valley. Suitable habitat dose not occur at any of the proposed Radar/Communications sites.
		Mammals	
Townsend's big-eared bat *Corynorhinus townsendii*	NDOW=P, S BLM	Desert shrub to deciduous and coniferous forests at a wide range of elevations. Will use caves, mines, tree and rock cavities for roosting	The proposed activity area has foraging habitat, and adjacent hillsides provide potentially suitable breeding and roosting habitat for this species. Not expected occur on the sites.
Pygmy rabbit *Brachylagus idahoensis*	BLM, Proposed for federal listing	Sagebrush and rabbitbrush communities	May occur in northern limit of exercise area. May occur in northern limit of activity area. Not expected to be impacted by proposed activities.
Pahranagat Valley montane vole *Microtus montanus fucosus*	BLM	Found in grassy areas near springs	Known to occur in the Pahranagat Valley. Suitable habitat is absent.
Spotted bat *Euderma maculatum*	NDOW=P, T ST BLM	Roosts in crevices in cliff faces, bridges, and mines	Could occur in region but not likely to occur near proposed Radar/Communications sites.
Allen's big-eared bat *Idionycteris phyllotis*	NDOW=P BLM	Pine and oak forests. Roosts in caves and mines.	Outside suitable range of this species. Not likely to occur near any Radar/Communications site.
California leaf-nosed bat *Macrotus californicus*	NDOW=P, S BLM	Desert scrub. Roosts in caves and abandoned buildings	Could occur in exercise area but not likely to occur near proposed Radar/Communications sites.
Western small-footed myotis *Myotis ciliolabrum*	BLM	Desert scrub, chaparral and rangeland. Roosts in mines and caves.	Known to occur in general region. Not likely to be effected by Radar/Communications sites.

Common Name Scientific Name	Status	Habitat Type	Known or Potential Occurrence in the Proposed Exercise Area
Long-eared myotis *Myotis evotis*	BLM	Desert scrub, forest, and chaparral. Roosts in cliff faces, caves, mines and abandoned buildings	Could occur in region. Prefers forest communities. Not expected to occur at any Radar/Communications site.
Fringed myotis *Myotis thysanodes*	NDOW=P BLM	Desert scrub, shrub-steppe, oak-pinyon and coniferous forest habitats. Roosts in caves, rock crevices and buildings.	Known to occur in general region. Not likely to be effected by Radar/Communications sites.
Long-legged myotis *Myotis volans*	BLM	Typically associated with montane forests, riparian and desert habitats. Roosts in rock crevices in cliffs, cracks in ground, behind loose bark on trees and in buildings.	Known to occur in general region. Not likely to be effected by Radar/Communications sites.

FT = Federally Threatened Species
FE = Federally Endangered Species
ST = State Threatened species
SP = Nevada State Protected - Species protected under NRS 501
BLM = BLM Sensitive Species
SE = State Endangered Species
Nevada Department of Wildlife (NDOW) Species of Conservation Priority / Nevada Natural Heritage Program =NNHP
Global and State Ranks:
G - Global rank indicator, based on worldwide distribution at the species level
S - State rank indicator, based on distribution within Nevada at the lowest taxonomic level
1 - Critically imperiled and especially vulnerable to extinction or extirpation due to extreme rarity, imminent threats, etc.
2 - Imperiled due to rarity or other demonstrable factors
3 - Vulnerable to decline because rare and local throughout its range, or with very restricted range
4 - Long-term concern, though now apparently secure; usually rare in parts of its range, especially at its periphery
5 - Demonstrably secure, widespread, and abundant
H Historical; could be rediscovered
P Potential within Nevada
Q Taxonomic status uncertain
NR Taxon is not yet ranked
NA Rank is not applicable; Taxa is not a suitable target for conservation (usually due to accidental or exotic status)

Sources: USAF, 1999, 2001; NNHD, 2004; NDOW, 2004a, 2004b, 2004c; USFWS 2005; BLM 2003

The desert tortoise is the only federally listed wildlife species that has the potential to occur in the proposed Radar/Communication activity area. This species has limited potential to occur near the LSA located at the Alamo airfield. However, several sightings of desert tortoise have been recorded in the United States Geological Survey (USGS) quads Alamo SE and Alamo (NDOW, 2004a). In addition, BLM has identified tortoise habitat near the proposed LSA site. However, the BLM indicated the conditions at the Alamo site were not currently favorable for this species (BLM 2007a). The USACE completed a Biological Assessment (BA) to evaluate potential impacts to this species from implementation of the 2005 Joint Red Flag exercises and did not detect sign of desert tortoise at the proposed LSA site or the LSA access road. See Figure 3.2-1 for a map of known desert tortoise habitat.

Critical habitat for this species does not occur at any of the proposed Radar/Communications sites or the proposed LSA.

The project region also supports a variety of animal species protected by the BLM and the State of Nevada. Some of these include the burrowing owl, pygmy rabbit, and dark kangaroo mouse (*Microdipodops magacephalus*). Various raptors and other migratory birds are also common and are expected to occur within the proposed exercise area.

Burrowing owls are year-long residents of open, dry habitats, including open shrub stages and juniper habitat. This species typically utilizes abandoned rodent burrows for nesting cover, but will occupy pipes, crevices, and small openings in rock faces and is known to occur in the exercise area. An inactive burrow was noted in the Sand Springs Valley on one of the sites (Table 3.2-1: Site Description at Proposed Radar/Communications Sites) and two suitable burrows lacking signs of use (pellets, wash, feathers, throw) were noted at Site 112G Alternative. Although not observed during the October or December biological surveys, this species may occur near the proposed Radar/ Communications sites.

Pygmy rabbits, a BLM species of concern and currently being considered for listing by the USFWS, have not been reported to occur in the exercise area. The pygmy rabbit is the smallest rabbit species in North America and is found only in the sagebrush and pinyon juniper habitat in the Basin and Modoc Plateau Regions in California, Oregon, Nevada, Idaho, Washington, and Utah (Orr, 1940; Janson, 1946; Wilde, 1978). Tall, dense sagebrush clumps are essential for this species (Orr, 1940). This species is believed to avoid heavily grazed areas and populations are thought to be randomly distributed (CDFG, 1990). Potential pygmy rabbit habitat occurs in the extreme northern section of the Sand Springs, Coal, and Garden Valleys, but does not occur at the proposed sites.

3.3 WATER RESOURCES AND HYDROLOGY

3.3.1 Existing Conditions

This section addresses surface and groundwater features of the project area. The proposed Radar/Communications sites are located within the Great Basin Region of the Basin and Range Physiographic Province of the United States. This province is characterized by north/south trending mountain ranges that are separated by alluvial basins and valleys. The White River is the main river that intersects the proposed project area.

The Great Basin subprovince is characterized by low rainfall, ephemeral streams, internal surface drainages, and large, sparsely distributed springs. Because the area drains internally, no streams that arise within the Basin and Range Province carry water to the oceans. Practically all the precipitation that falls in the area is returned to the atmosphere by evaporation and evapotranspiration, making it the driest Province in the Nation (USGS, 1995).

3.3.2 Surface Water

Hydrology

The proposed Radar/Communication sites are located in the Sand Springs Valley, Coal Valley, Delamar Valley, and Dry Lake Valley. The scarcity of surface water in these areas is attributed to the dry regional climate, which is characterized by low precipitation, high evaporation, low humidity, and wide extremes in daily temperatures. Temperatures range from below freezing in the winter to over 100°F in the summer months. Table 3.3-1 summarizes average temperature and precipitation for the area of the proposed exercises.

Table 3.3-1. Annual Average Precipitation, Temperature and Snowfall Data

Location	Average Temperature (°F/°C)				Precipitation (inc./cm)		
	January		July		Wettest Month	Driest Month	Total Annual Average
	(min)	(max)	(min)	(max)			
Alamo	20.1/ -6.6	51.0/ 10.5	55.0/ 12.7	100.3/ 37.8	(Jan) 0.65/ 0.18	(June) 0.07/ 0.18	4.88/ 12.4
Caliente	17.4/ -8.1	46.2/ 7.8	56.5/ 13.6	95.4/ 35.2	(March)1.05/ 0.89	(June) 0.35/ 0.89	9.04/ 23.0
Elgin	28.2/ -2.1	53.0/ 11.6	60.1/ 15.6	98.0/ 36.6	(Feb) 2.02/ 1.04	(June) 0.41/ 1.04	12.30/ 31.2
Hiko	23.9/ -4.5	50.4/ 12.2	59.4/ 15.2	96.0/ 35.5	(March) 0.86/ 0.74	(June) 0.29/ 0.74	7.94/ 20.2
Pioche	21.2/ -6.0	41.5/ 5.3	58.3/ 14.6	87.7/ 31.0	(Jan) 1.57/ 1.23	(June) 0.48/ 1.23	13.37/ 34.0
Rachel	14.6/ -9.6	45.0/ 7.2	53.8/ 12.1	94.0/ 34.4	(March) 1.07/ 0.66	(June) 0.26/ 0.66	7.87/ 20.0

Source: Lincoln County, 2001.

Ephemeral Streams

Due to the arid conditions of the area, most of the surface waters that exist in the region are ephemeral streams. The ephemeral streams in the area of the proposed Radar/Communication sites are typically dry washes and playa surfaces (dry lake beds), and only flow in response to precipitation. Regional storms, which generally occur in the winter months, are typically of low intensity, but can create short-lived ephemeral streams and cause significant flooding on the playa lake beds. Alternatively, locally intense summer thunderstorms within the mountainous portions of the area can produce flooding in the low-lying valleys. During summer months, ephemeral streams may only last for a couple of hours, while during the winter months, they have the potential to last up to a couple of weeks.

Several major dry lake beds located in the project area include Delamar Dry Lake, Dry Lake Valley (Dry) Lake, and Coal Valley Dry Lake. In addition, the Coal Valley Reservoir and the Murphy Gap Reservoir are located in the Coal Valley. The proposed Radar/Communication exercises would cross several dry streams, washes, and playas but no activities would occur in ponded or flowing water (SOP).

Perennial Surface Water

The only perennial surface water in the project area is the White River; however, project activities would not occur in or adjacent to this resource. This ancient perennial river is supported from large thermal springs along the flood plain, primarily Ash Springs and Crystal Springs.

Perennial surface waters located in the region include several lakes and springs. There are five major lakes in the area of the proposed Radar/Communication exercises, all of which are located in the Pahranagat Valley (State of Nevada, 2007). The list below summarizes these hydrologic features.

- Nesbitt Lake - located approximately 2.8 miles north of Crystal Springs;
- Frenchy Lake - located immediately north of Crystal Springs and the Key Pittman Wildlife Management Area;
- Upper Pahranagat Lake - located within the Pahranagat National Wildlife Refuge, approximately 3.8 miles southeast of the town of Alamo;
- Lower Pahranagat Lake - located within the Pahranagat National Wildlife Refuge, approximately 4.7 miles southeast of Upper Pahranagat Lake; and
- Maynard Lake - located within the Pahranagat National Wildlife Refuge, approximately 2.8 miles southeast of Upper Pahranagat Lake. Water rarely flows below Maynard Lake.

There are also several large, sparsely distributed springs within the proposed exercise area. Some of the main springs include Crystals Springs, Ash Springs, and Lone Tree Springs (UGSG, 2004). Lincoln County has not been mapped for flood plains, but the Radar/Communications sites are located in an area that has numerous ephemeral streams and playas, as described above.

Water Quality

The quality of surface water in southern Nevada varies greatly. Surface water quality, especially as it pertains to springs and seeps in the proposed exercise area, is primarily controlled by the physical and chemical characteristics of the rocks through which the groundwater flows prior to discharge to the surface. Environmental factors such as precipitation, evapotranspiration, and erosion also influence water quality (USAF, 1999).

3.3.3 Groundwater

The proposed Radar/Communication exercises would be located in the Basin and Range Physiographic Province, which contains three principal aquifer types collectively referred to as the "Basin and Range" aquifers. Groundwater in the project area moves under the influence of hydraulic gradients along convoluted pathways (characterized as areas of higher precipitation) and areas of surface discharge (characterized by springs and playas). Groundwater flows from the surrounding highlands toward the topographic low point within the basin, similar to flow of surface water after a storm event. Aquifers in the area are primarily composed of carbonate-rock and basin-fill material and are not continuous or regional due to the complex faulting in the region (USGS, 1995; State of Nevada, 2007). The greatest opportunity for groundwater recharge is in areas of permeable surface materials, such as alluvial fan deposits, during periods when precipitation is in excess of evapotranspiration. However, because evaporation usually exceeds precipitation rates, the amount of groundwater recharge that occurs on valley floors is generally limited (USAF, 1999; 2005).

The depth to ground water in Lincoln County ranges between 393 to 863 feet below land surface datum (lsd) (USGS, 2004). In the proposed exercise area, dissolved solid concentrations vary between 500 milligrams per liter to 1,000 milligrams per liter (USGS, 1995). Generally, groundwater located at the

basin margins and on the slopes of alluvial fans is fresh, whereas groundwater that accumulates beneath playas in small closed valleys tends to be brackish (USGS, 2004).

3.4 EARTH RESOURCES

3.4.1 Geology

The proposed Radar/Communication sites are located within the Basin and Range Physiographic Province. As described in Section 3.3.1, this section is characterized by north/south trending valleys and basins bordered by correspondingly oriented mountain ranges. The principal rock formation underlying the region consists of a thick sequence of Paleozoic carbonate rock that extends throughout the subsurface of much of central and southeastern Nevada, including the areas of the proposed Radar/Communication exercises. Important formations that interact with the regional flow through the underlying Paleozoic carbonate rocks consist of fractured Cenozoic volcanic rocks and permeable Cenozoic basin-fill. Diverse rock types, ages, and deformational structures are juxtaposed, creating variable and complex subsurface conditions throughout the project area (USGS, 1995). Several late Cenozoic silicic calderas occur immediately west of the proposed exercise area. The area containing these calderas is referred to as the southwestern Nevada volcanic field (USGS, 2007). During the past 10 million years, low-volume, mild eruptions of basalt occurred in the region, resulting in basaltic cinder cones and lava flows (USAF, 1999). No Radar/Communications related exercises would occur in the southwestern Nevada volcanic field.

3.4.2 Soils

The soils of the Base and Range have not been mapped in detail. Based on observations made during cultural resources survey work and Quaternary geologic studies in adjacent areas, soils in the project area are aridisols developed in carbonate parent material, usually with weak, vesicular A horizons, strong B horizons and, depending on the age of the parent sediment, moderately to very strongly developed C horizons (USAF, 1999). Surface soils in the region range from sandy and clayey loams occurring on alluvial fans, to sand, silty sands, and silts located in the various drainages and the numerous, small, basins that occur in the region. Patchy desert pavements of mostly pebbles and small clasts occur irregularly on stable surfaces associated with alluvial fans deposits, particularly in the southern portion of the proposed exercise area. Pebbles, cobbles and small boulders, mostly commonly derived from rhyolitic lavas, quartzite and chert erode from the local mountain, are common and are evident in the alluvium fan formations throughout the region.

Soils with a slight to moderate potential for erosion, such as the Tybo-Koyen association, occur throughout the project area and at several of the Radar/Communications sites (see Table 3.2-2). These soils have the potential to "powder out" with repeated use of vehicles on and off of roads. Soils with the potential to powder out often support winterfat and are described as silty. Sites 112E, 112C, 110E, 110F, 108, 109, 112H, and 102 support soils which could powder out due to vehicle use in the project area (NRCS, 2008).

Potential Prime Farmland occurs at Radar/Communications site 110G, 102, and 112G. However, this designation is only made provided the soil is irrigated, the product of I (soil erodibility) and C (climate factor) does not exceed 60, and the soil is reclaimed of excess salts and sodium (NRCS, 2008). However, none of the Radar/Communications sites is currently or was historically used to grow crops and no irrigation is present.

3.4.3 Minerals

In the last 50 years, little mineral exploration or related activity has occurred in Lincoln County. However, given high mineralization of the mountain ranges surrounding the project area, there is potential for discovery of new mineral resources in the area (AARI, 1990). Other industrial minerals known to occur in Lincoln County include: perlite, clay, soils additives, pumice, cinder, diatomite, fluorspar, gypsum, and zeolite. Sand and gravel are also plentiful within the proposed exercise area. In addition, fossil fuels have been located along the over-thrust belt of the Paleozoic carbonate rocks in eastern Nevada. Currently, Railroad Valley, located northwest of the proposed exercise area, is one of the largest known domestic oil reserves in the country (AARI, 1990). The proposed Radar/Communications sites would not be located near or immediately adjacent to a known mineral resource area.

3.5 LAND USE

Existing Conditions

Located entirely on public land administered by the BLM, the proposed Radar/Communications exercises would occur under Nellis AFB designated airspace. This airspace extends over Nevada's three southeastern counties: Lincoln, Nye, and Clark. However, the ground-based portion of the proposed exercises would occur on public land administered by the BLM within Lincoln County, while the transport of military vehicles would occur in Lincoln and Clark Counties (see Section 3.10, Transportation).

As discussed in the Environmental Assessment for the Joint Red Flag '05 ADA activities completed in 2005 (USAF, 2005), Lincoln County is primarily undeveloped public land administered by the BLM with expansive open space areas consisting of several mountain ranges and dry lake beds. The public lands in Lincoln County have been designated for a variety of uses, which include agricultural, residential, commercial, and recreational activities such as mining, hunting, and camping (USAF, 1999). See Section 3.8 (Recreation) for a discussion of recreational activities. The proposed sites are located within BLM allotments that have multiple uses which include livestock grazing. The proposed Radar/Communications exercises would occur over an area of nearly 2.5 million acres of rangeland, of which approximately 79.8 acres would be subject to routine use as Radar/Communications facilities.

In addition to rangeland, several Wilderness Areas are located within Lincoln County, which were created by Congress in 2004 (Public Law 108-24) (BLM, 2007). Certain uses are restricted within each Wilderness Area boundary, such as automobiles, off-highway vehicles, motorcycles, and mountain bikes (BLM, 2007). Figure 3.2-1 shows the location of the proposed LSA and Radar/Communication

sites relative to each Wilderness Area. None of the proposed sites would be located in a designated Wilderness Area.

Clark County is located to the south of Lincoln County and east of Nye County, and is the most urbanized of the southeastern counties. Although it is characterized by similar mountain ranges, central Clark County is predominated by the city of Las Vegas, with Nellis AFB located adjacent to and northeast of Las Vegas. The proposed Radar/Communications exercises within Clark County would be limited to the transport of equipment and personnel from Nellis AFB to the proposed exercise area. No Radar/Communication sites occur in Clark County.

3.6 AESTHETICS

Existing Conditions

The proposed Radar/Communications exercises would be located in the Great Basin Physiographic Province. The Basin Province consists of rough, rocky, mountains formed by northerly trending fault blocks. These ranges are typically separated by arid basins and ranges. Wide valleys are frequently interconnected across low divides.

The regional character of the exercise area is rural and undeveloped, with land uses consisting primarily of public range lands, agricultural operations, scattered rural residences, dispersed recreation facilities and areas, and small rural communities such as Alamo and Hiko, located along the U.S. Highway 93/ State Route (SR) 318 travel corridor between Pioche and Las Vegas. Adding to the visual character of the region along SR 373 is the small, rural community of Rachel. There are also a number of linear facilities in the region including an underground fiber optic line and electric transmission and distribution lines, and miscellaneous communication lines (see Section 3.13).

Views in the proposed Radar/Communications exercise area are frequently expansive, across flat rangelands and basins in the foreground/middleground, to distant mountains, isolated peaks, and plateaus in the background. The typical viewers of the proposed Radar/Communications exercises would be local residents, recreational visitors, and motorists traveling on U.S. Highway 93, SR-318, SR-375, and other local roads. Military vehicles and equipment traveling to and from the designated Radar/Communications sites during the proposed exercises, as well as the mobile Sentinel units, would be visible to the public for a short period of time while on these roadways. Two Radar/Communication sites (108 and 109) are located directly off U.S. Highway 93 and would be visible to traffic utilizing this highway. However, most of the proposed Radar/Communications sites are located well out of the viewscape of traveling motorists on local Highways.

Visual Resource Management Classes

The Project area is located on Public lands administered by the BLM. These lands have a variety of visual values that are subject to visual resource management objectives developed using the BLM Visual Resource Management (VRM) System (BLM, 1984, 1986).

VRM classifications have been designated in the appropriate Resource Management Plan (RMP). Other BLM administered lands do not have RMP-approved VRM classifications, as is the case for much of the proposed exercise area. Accordingly, "Interim" VRM Classes have been developed by the BLM for lands crossed by the proposed Radar/Communications exercises and have been classified as VRM Class IV (BLM, 2007). The objective of VRM Class IV is "to provide for management activities that require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic element".

3.7 RECREATION

Existing Conditions

As described in the Section 3.5, Land Use, the ground-based portion of the proposed exercise would occur on public lands administered by the BLM within Lincoln County. While the LSA and Radar/Communications sites would be located in the vicinity of several recreational areas, the proposed exercises would not traverse these recreational areas. The Sentinel radar units that may stop along the roadsides during the live fly phase of the exercises would utilize secondary roads, and would not conduct exercises adjacent to recreational facilities.

Recreational facilities that are located within the vicinity of the proposed Radar/Communications exercises include the following:

- **Ash Springs Wildlife Area.** This wildlife area is located adjacent to Ash Springs. As one of the few remaining desert oases in Nevada, the wildlife area is managed by the BLM as a unit of the Desert National Wildlife Refuge Complex, and consists of a spring-fed mineral pool that provides habitat for the endangered white fish. Recreational opportunities include hiking, picnicking and wildlife viewing (DOI, 2004).
- **Desert National Wildlife Range.** This wildlife range is located south of Alamo. The range was established to preserve habitat for the desert bighorn sheep, and is managed by the USFWS as a unit of the Desert National Wildlife Refuge Complex. Recreational opportunities include camping, horseback riding, environmental education, and wildlife viewing (USFWS, 2004).
- **Key Pittman Wildlife Management Area.** The management area is located south of Hiko. The area is managed by the Nevada Department of Wildlife (NDOW) for the protection of wetlands and waterfowl. Recreational opportunities include boating, hunting, and trapping (NDOW, 2004a).
- **Leviathan Cave Geologic Area.** This area is located in a remote location on the east side of the Worthington Mountain Range. Situated on public lands administered by the BLM, the Leviathan Cave is a series of tunnels and chambers that is visited primarily by spelunkers and geologists.
- **Pahranagat National Wildlife Refuge.** This refuge is located south of Alamo, adjacent to U.S. Highway 93. The refuge was established to provide habitat for migratory birds, and is managed by the USFWS as a unit of the Desert National Wildlife Refuge Complex. Recreational opportunities include boating, fishing, hiking, camping, picnicking, hunting, and wildlife viewing (DOI, 2004).
- **White River Narrows Archaeological District.** The White River Narrows Archaeological District is located on SR-318, north of Hiko. White River Narrows is managed by the BLM and is home to cultural artifacts such as petroglyphs. The site was placed on the National Register of Historic Places in 1976 (Lincoln County, 2004).

- **Ash Springs Public Rock Art Site.** Located south of Ash Springs. Ash Springs is managed by the BLM for the enjoyment of the public, is actively monitored by the Nevada Site Steward Program, and is home to cultural resources associated with habitation sites, including petroglyphs and semi-circular rock alignments. Site was determined eligible for the National Register of Historic Places in 1986.

Many recreational activities occur on public land administered by the BLM that is outside of the established recreational facilities listed above. Additional opportunities for recreation include hunting, wildlife viewing, hiking, camping, off-highway vehicle activities, horseback riding, land sailing, rockhounding, recreational mining, and hunting. Hunting and off-highway vehicle activities are described in greater detail below. Recreationists also visit the area to explore the ghost towns and petroglyph sites within Lincoln County, and to observe military activities that are conducted within the area.

Hunting activities within the state of Nevada are managed by the NDOW. Bighorn sheep, mule deer, pronghorn antelope, Rocky Mountain elk, mountain goat, and upland game are hunted throughout this region of the state. While the hunting seasons vary for each game species, the seasons generally occur in the fall months (NDOW, 2004b).

Off-highway vehicle activities including races frequently occur east of U.S. Highway 93 in the vicinity of Alamo (BLM, 2005). Such activities may include off-highway vehicle races, which are often scheduled throughout the year.

3.8 NOISE

Existing Conditions

Current military training exercises involve low level flights by military aircraft over the project area which creates subsonic overflight noise and sonic booms over the project area. All the proposed sites are located under MOA airspace boundaries and would be subject to ongoing military activities. A baseline ambient noise study was completed as part of the Environmental Assessment for the Joint Red Flag '05 ADA activities (USAF, 2005), which covered the eastern half of the current proposed project area. That area is similar to the western half of the proposed project area in that both areas lie under MOA airspace, proposed sites are both near and far from highways, and wind conditions are similar throughout. Results of the study, provided in Table 3.8-1 below, indicated that average noise from winds reached highest levels (74.0 dBA), followed by aircraft overflights (62.9 dBA), and highway traffic (44.5 dBA). However, it should be noted that supersonic and low altitude flights are currently intermittent throughout the MOA and are louder than the maximum wind noise for these data, as shown in Table 3.8-2.

Table 3.8-1. Measured Ambient Noise Levels Within the Proposed ADA Activity Area

Location	Survey Date	Survey Period	Leq	Max	Min	Notes
LSA	12/21/04	2:05-2:15 p.m.	74.0	86.9	53.6	High winds.
Patriot 1	10/15/04	12:20-12:30 p.m.	51.7	68.8	31.7	Airplanes overhead and wind.
Patriot 3	10/16/04	11:30-11:40 a.m.	45.6	59.0	27.8	Wind.
Patriot 4	10/16/04	9:25-9:35 a.m.	44.5	60.1	32.0	Traffic along U.S. Highway 93. Maximum caused by motor home driving by.

Location	Survey Date	Survey Period	Leq	Max	Min	Notes
Patriot 101	10/15/04	3:20-3:30 p.m.	62.9	73.5	37.1	Airplanes overhead.
Patriot 103	10/16/04	1:50-2:00 p.m.	59.6	71.0	39.5	Wind.
Patriot 104/104A	10/16/04	3:00-3:10 p.m.	39.7	52.2	32.3	Wind.

Source: USAF, 2005 (Table 3.8-1).
Notes: All measurements are in dBA; Measurements were taken on 15-16 October 2004 and 21 December 2004.
Leq= Equivalent Sound Level, a measurement (in this case 10 minutes) that accounts for the moment-to-moment fluctuations due to all sound sources during the measurement period, combined.
Lmax= The maximum sound level reached during a sampling period.
Lmin= The minimum sound level reached during a sampling period.

Table 3.8-2. Sound Exposure Levels (SEL) in dB at Various Altitudes in the NTTR*

	ALTITUDE IN FEET ABOVE GROUND LEVEL						
Aircraft Type	300	500	1,000	2,000	5,000	10,000	20,000
B-1B	115	112	107	101	92	82	69
F-15C	116	112	107	101	90	80	65
F-16	106	103	98	91	81	70	56
A-10	99	95	89	82	72	63	53
C-130	99	96	91	85	77	69	61
F-22**	118	114	108	102	92	83	73

Source: USAF, 2002
* Level flight, steady high-speed conditions
** Projected based on F-18 aircraft

Sensitive Receptors

A land use survey was conducted to identify sensitive receptors, such as residences, schools, places of worship, in the general vicinity of the proposed sites. No sensitive receptors were identified. For the LSA (Alamo airfield), vehicles and equipment would travel through a generally well populated area within the community of Alamo on existing residential streets. Access to the LSA site would occur from U.S. Highway 93 using Broadway or 1st Street South. Potential sensitive receptors would include residences (single-family), recreational facilities (baseball fields and tennis courts), the Pahranagat Valley Senior Citizens Center, Alamo Sheriff's office, and Pahranagat Valley Middle School (off 1st Street South). The site itself is located approximately one mile from the closest sensitive receptor (senior center).

3.9 SOCIOECONOMICS/ENVIRONMENTAL JUSTICE

Existing Conditions

The region of influence for the socioeconomic analysis comprises the area in which ground-based activities and related economic impacts could be expected. The proposed exercises would primarily occur within Lincoln County, while transportation of military vehicles would occur within Clark County. Clark County is home to the city of Las Vegas, which contributes to the county's mostly urbanized population. Lincoln County is predominately rural and has the smallest population of the southeastern counties. The estimated population of Clark County in 2000 was 1,375,765 with a 28.4 percent minority population. The 2000 racial mix in Clark County consists of Caucasian (71 percent),

African American (9 percent), Native American (0.1 percent), Asian American (5 percent), Pacific Island (0.5 percent) and people reporting two or more races (4 percent). Persons of Hispanic origin comprised 21 percent of the population of Clark County (U.S. Census Bureau, 2004). For Lincoln County the 2000 racial mix in consists of Caucasian (92 percent), African American (1 percent), Native American (1 percent), Asian American (0.3 percent), Pacific Island (0.2 percent) and people reporting two or more races (2 percent). Persons of Hispanic origin comprised 5 percent of the population of Lincoln County (U.S. Census Bureau, 2004).

There are two Native American Tribes located in Clark County. However, the only tribe that is located within the vicinity of the proposed exercises is the Moapa Band of Paiute Indians, situated on the Moapa River Indian Reservation that is southwest of Moapa and west of the Valley of Fire State Park. The reservation is located south of and adjacent to the Nellis airspace, approximately three miles east of U.S Highway 93. No Radar/Communications activity would occur in proximity to the Moapa River Indian Reservation.

The 1999 per capita personal income of Clark and Lincoln Counties was $21,785 and $17,326 respectively while the median household income for the two counties was $44,616 and $31,979. The median household income for the State of Nevada was $44,581 (U.S. Census Bureau, 2004). The 1999 census reported that 10 percent of the Clark County and 11.5 percent of Lincoln County population lived below the poverty level. The State of Nevada average is 11 percent.

Environmental Justice

EO 12898, Environmental Justice, was issued by the President on February 11, 1994. Objectives of the EO, as it pertains to this EA, include development of Federal agency implementation strategies and the identification of low-income and minority populations potentially disproportionately affected because of proposed Federal actions. Accompanying EO 12898 was a Presidential Transmittal Memorandum referencing existing Federal statutes and regulations to be used in conjunction with EO 12898. One of the items in this memorandum was the use of the policies and procedures of NEPA. Specifically, the memorandum indicates that: "each Federal agency shall analyze the environmental effects, including human health, economic, and social effects, of federal actions, including effects on minority communities and low-income communities," when such analysis is required by the NEPA 42 U.S.C. section 4321 et. seq. Although an environmental justice analysis is not mandated by NEPA, Department of Defense (DOD) has directed that NEPA will be used as the primary mechanism to implement the provision of the EO.

3.10 TRANSPORTATION

Existing Conditions

Figure 3.10-1 depicts the major roads in the proposed ADA activity area, other roads and trails are too numerous to depict on this type of figure. The proposed exercises would begin as a single convoy heading from Nellis AFB in the north Las Vegas Valley to the proposed exercises area. Major roadways affected by the proposed exercises would include Las Vegas Boulevard (SR-604), I-15/U.S.

Highway 93, SR-375 and SR-318. These roadways are maintained by the State of Nevada Department of Transportation (NDOT).

Las Vegas Boulevard runs in a northeast-southwest alignment through North Las Vegas, Nevada and provides access from Nellis AFB to the highway (I-15/93). I-15/U.S. Highway 93 is the largest highway in the area and runs in a northeast-southwest alignment through Las Vegas, Nevada. U.S. Highway 93 (Great Basin Highway) diverges from the I-15 at Exit 64, and runs in a north-south alignment from North Las Vegas in Clark County, Nevada and into Lincoln County, Nevada where it provides access to the communities of Alamo, Caliente, Panaca, and Pioche. U.S. Highway 93 meets SR-375 and SR-318 in Crystal Springs. SR-375 runs northwest out of Crystal Springs providing access to Rachel before connecting with U.S. Highway 6 at Warm Springs. SR-318 runs north out of Crystal Springs providing access to Hiko before connecting with U.S. Highway 6 just past Preston in White Pine County, Nevada.

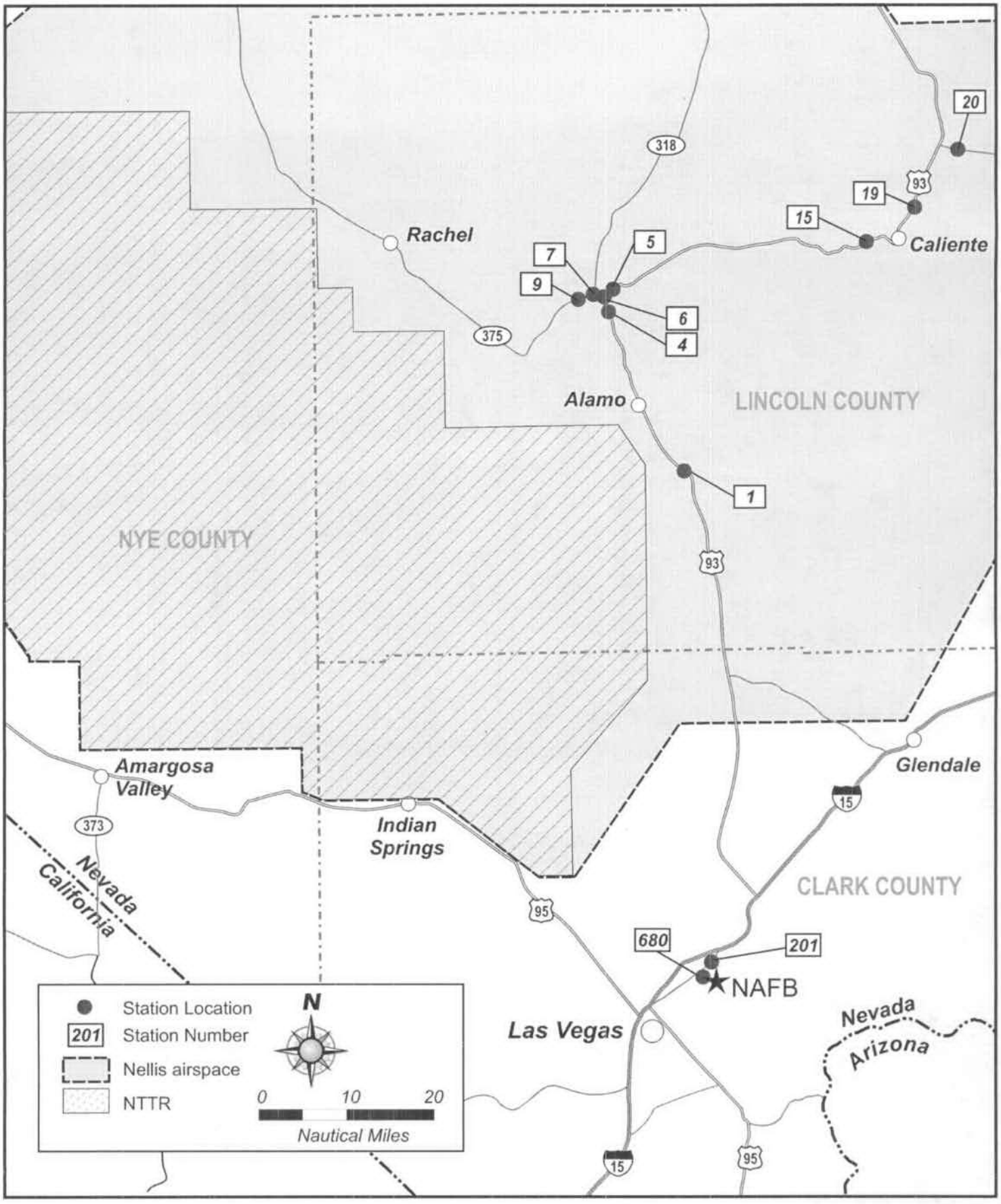
Once off the major roadways the roads used to access the proposed sites and the LSA generally consist of a network of graded rural dirt roads, which are approximately 12 to 24 feet wide. Most of these rural roads have very low use, and vehicle movement is free flowing. During the course of the surveys conducted in October 2007 few if any vehicles were observed in the off-road section of the project area. Vehicle traffic included cattle ranchers, government vehicles, several civilian passenger vehicles, and road grading equipment.

Annual average daily traffic volumes measured for the major roadways in the vicinity of the proposed exercises area are presented in Table 3.10-1. The location of the traffic-count stations are shown on Figure 3.10-1 for reference.

Table 3.10-1: Average Annual Daily Traffic on Selected Roadways in the Proposed ADA Activity Area

Station	Location	2006 Daily Traffic Count
	CLARK COUNTY	
201	SR-604 (Las Vegas Blvd.), 100 feet north of Checker Flag Ln.	4,150
680	SR-612 (Nellis Blvd.), 0.1 mile south of SR-604 (North Las Vegas Blvd.)	24,000
	LINCOLN COUNTY	
1	US-93, at mp LN-25 South of Alamo	1,550
4	US-93, 0.6 miles south of SR-318 near Crystal Springs	1,800
5	US-93, 0.1 miles north of SR-375	580
6	SR-318 (Sunnyside Cutoff Rd.), 0.1 miles west of US-93 near Crystal Springs	1,500
7	SR-318 (Sunnyside Cutoff Rd.), 1.6 miles north of SR-375	1,300
9	SR-375 (Warm Springs Rd.), 0.7 miles west of SR-318 at Crystal Springs	220
15	US-93, 0.5 miles south of SR-317 in Caliente	620
19	US-93, near the northern city limits of Caliente, 0.1 miles north of mp 95	1,350
20	County Rd. to Beaver Dam State Park, North of Caliente, 0.2 miles east of US-93	90

Source: NDOT, 2006



Major Roads in the Proposed ADA Activity Area

Patriot Communications Exercise

Figure 3.10-1

3.11 HAZARDOUS AND TOXIC SUBSTANCES

The proposed Radar/Communications sites are generally undeveloped and consist of open land with a vegetative cover of Great Basin Desert plant species. The exception to this would be the LSA and Site 108, which are located on dirt airfields. There are no structures on any of the sites and no evidence of present or past exposure to hazardous or toxic substances. Any potential leaks of fuel oil or other fluids associated with air field operations or miscellaneous debris found on the proposed sites would be limited to surface exposure. No signs of soil discoloration were observed during the site investigations completed by Aspen Environmental Group from 28-31 October, 2007. Additionally, there are no hazardous waste sites located on or in the immediate vicinity of any of the proposed sites (USAF, 2005; EDR, 2007; USEPA, 2007).

The majority of the non-weapon hazardous materials used by the USAF, U.S. Army, and contractor personnel are controlled through a pollution prevention process called HAZMART, or hazardous pharmacy. This process provides management for the procurement, handling, storage, and issuing of hazardous materials and the turn-in, recovery, reuse, recycling, or disposal of hazardous wastes.

3.12 SAFETY

The project area is generally located far from any population centers, with the exception of the LSA, which is located just east of Alamo, Nevada. Safety issues associated with the proposed Radar/Communications exercises include fire risk, radio (radar) frequency emissions, and general emergencies (USAF, 2005).

Radio Frequency Emissions

To provide training realism, threat simulation electronic emitters (radars) would be located throughout the proposed ADA activity area. The frequencies at which radars operate are in the radio frequency (RF) band of the electromagnetic spectrum. Potential effects of RF energy on biological species are discussed below, as presented in the Environmental Assessment for the Joint Red Flag '05 ADA activities completed in 2005 (USAF, 2005).

RF energy is absorbed macroscopically by an animal or human body in the form of heat and is defined as an increase in the mean kinetic energy of the molecules. The result is a temperature increase. At relatively low RF energy intensities, the heat induced can usually be accommodated by the thermoregulatory capabilities of the species exposed. Thus, any effects produced would generally be reversible. At high intensities, the thermoregulatory capabilities of any given species may be exceeded, which could lead to thermal distress or even irreversible thermal damage.

The effects of RF energy on people depend on the frequency and polarization of the energy field, the size and shape of the individual, and the individual's ability to dissipate the absorbed energy by a normal biological response. Department of Defense Instruction (DoDI) 6055.1 (1995) has set the permissible exposure limit (PEL) for personnel. These PELs represent conditions under which it is believed that humans may be repeatedly exposed without adverse effects, regardless of age, sex, or

childbearing status. Depending on the RF frequency, the PEL for personnel working in a designated controlled environment where the emitter is operating is 10 milliwatts per square centimeter (10 mW/cm2) over any continuous 6-minute period. For persons in an uncontrolled environment (i.e., the public), the PEL is 5 mW/cm2 over any continuous 6-minute period. Repetitive exposures to these levels (that are less than 6-minutes each) are not expected to be harmful. Most studies have shown that, in general, people can actually be exposed to up to 10 times the above-stated PEL without any harmful health effects.

3.13 CULTURAL RESOURCES

Existing Conditions

As required by Section 106 of the National Historic Preservation Act (NHPA), cultural resources inventory of the proposed Radar/Communications sites was completed on November 14th through 16th 2007. Two cultural resources properties, 26Ln5341 and 26Ln5342, were identified at two of the proposed Radar/Communications sites during the survey. Evaluation of 26Ln5342, a sparse lithic scatter, determined that the site is not eligible for nomination to the National Register of Historic Places (NRHP). Site 26Ln5341 is a multi-component site that includes historic structures and was evaluated as eligible for nomination to the NRHP. Consequently, this 5.7-acre site was shifted to the west beyond the Area of Potential Effect. No cultural resources were located on the alternate site. A Cultural Resources Report was completed in December 2007 and submitted to the BLM for consultation with the State Historic Preservation Officer (SHPO).

3.14 UTILITIES

The communities surrounding the proposed Radar/Communications activity area have existing utility infrastructure systems similar to most rural Nevada communities. The following section briefly describes the existing utility infrastructure as identified during the site visits conducted between 28 and 31 October 2007.

Existing Conditions

Because government agencies have recently categorized data pertaining to utility systems (including their location, capacity, and type) as sensitive, critical infrastructure information, public access to these data has become restricted for security reasons. As such, only information that continues to be made public and is readily accessible is presented in this section. While specific data would provide a better picture of the existing utilities within the proposed Radar/Communications activity area, in large part, this level of detail is unnecessary for the level of analysis needed to determine potential impacts generated by the proposed Radar/Communications exercises. The area is served by the utility providers listed in Table 3.14-1.

Table 3.14-1. Utility Providers in Lincoln County, Nevada

Utility	Provider
Natural Gas	No infrastructure or suppliers. Bottled gas (propane) is available from private distribution companies in the area.
Electricity	Lincoln County Power District

	Alamo, Caliente, and Pioche provide their own power, which is purchased from Lincoln County Power District. Panaca Power and Light Company South Panaca Power Group
Water/Sewer	Alamo, Caliente, Panaca (Panaca Farmstead Bureau), and Pioche (Pioche Public Utilities) provide their own water/sewage facilities
Fire Protection	Volunteer Fire Departments are located in the communities of Alamo, Caliente, Panaca, and Pioche BLM Wildfire Dispatch Office
Police Protection	Lincoln County Sheriff's Department Nevada Highway Patrol
Telephone	Lincoln County Telephone System, Inc.

Source: Lincoln County, 2004; LCBPD, 2004; and PUCON, 2004.

Within the area, specifically Lincoln County, there are two utility corridors; the Southwest Intertie Project (SWIP) corridor and the congressionally designated corridor for the Southern Nevada Water and Lincoln County water projects. One utility corridor runs along U.S. Highway 93 and heads north-northeast through the Delamar Valley and Dry Lake Valley up to the Town of Pioche and beyond. The other utility corridor runs east-west; across U.S. Highway 93 near Crystal Springs and heads west towards Tempiute and Rachel. The only other utility identified during the site visits includes a NDOT Traffic Counter Buried Cable (FOC) on the west side of U.S. Highway 93, running parallel to the highway (north-south alignment), near the intersection of U.S. Highway 93, SR-375, and SR-318. Electrical distribution lines, water, and sewer are common in the area and support the small communities of Alamo, Rachel and Hiko.

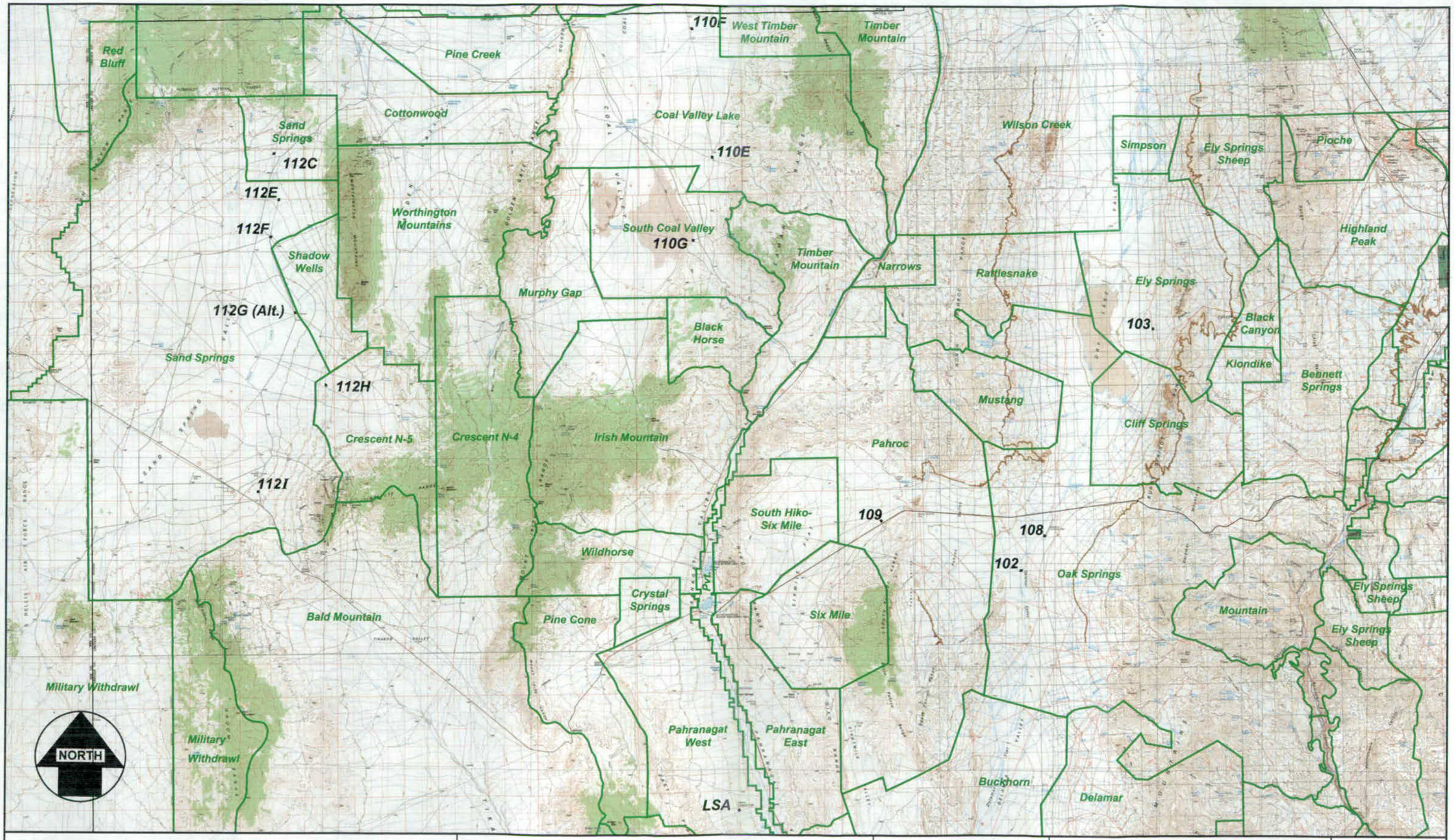
3.15 RANGE

The BLM land in Lincoln County has been designated for a variety of uses, which includes agricultural, residential, commercial, and recreational activities such as mining, hunting, and camping (USAF, 1999a). In the vicinity of the Radar/Communications sites, nearly all BLM land has been authorized for livestock grazing. Range use is the sole agricultural activity occurring in these areas. The proposed exercises would occur over an area of nearly 2.5 million acres of rangeland, of which 79.8 acres would be occupied by Radar/Communications sites. The proposed Radar/Communications sites were selected in coordination with the BLM to place the sites in areas of reduced foraging value. However, rangeland occurs throughout the region and watering sites occur adjacent to some of the proposed Radar/Communications sites.

During the exercise period, rancher permittees may be actively grazing cattle in the vicinity of the proposed Radar/Communications sites. See Table 3.15-1 for the schedule and AUMs allotted for grazing near each Radar/Communication site. Figure 3.15-1 identifies the location of the grazing allotments that occur in the proposed Exercise area.

Table 3.15-1. Grazing Allotments and Schedule

Allotment	Site(s)	Grazing Schedule	AUMs
McCutchon Springs	112C	3/1 – 2/28	456
Sand Springs	112E 112F 112G 112H 112I	3/4 – 2/28	7005
Coal Valley Lake	110E	3/1 – 5/15	765
		9/1 – 2/28	1869
	110F	3/1 – 5/15	522
		9/1 – 2/28	1244
South Coal Valley	110G	3/1 – 5/15	167
		9/1 – 2/28	399
		3/1 – 5/15	35
		9/1 – 2/28	85
		3/1 – 5/15	45
		9/1 – 2/28	107
Oak Springs	108 102	3/1 – 2/28	9276
Pahroc	109	No information available	No information available
Ely Springs Cattle	103	3/1 – 2/28	4248



		Scale: 1" = 27,500' Date: April 1, 2008 File: 1118-4nellisafbpt4graze	**BLM Grazing Allotments Site Locations**	**Figure 3.15-1**

SECTION 4.0
ENVIRONMENTAL CONSEQUENCES

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4.1 AIR QUALITY

4.1.1 Significance Criteria

Air quality impacts would be considered significant if they were to: (1) conflict with or obstruct implementation of the CCDAQM Nonattainment Area Plans or other relevant portions of the Nevada State Implementation Plan (SIP); (2) would violate any air quality standard or contribute substantially to an existing or projected air quality violation, whether solely or cumulatively; or (3) result in non-compliance with the Federal General Conformity Rule (40 CFR Parts 93, Subpart B).

4.1.2 Proposed Action

The proposed Radar/Communications activities would result in short-term air quality impacts due to diesel exhaust emissions from vehicle transport, vehicle idling, portable generator use, and minor emissions from support activities such as cooking and diesel refueling operations. Table 4.1-1 provides a conservative estimate of the total maximum emissions occurring as part of each proposed Radar/Communications exercise. Refer to Appendix C (Air Quality) for the methodology, assumptions, and emission factors used to estimate emissions.

Table 4.1-1. Estimated Emissions for Each Proposed Exercise (tons)

Emission Location	NOx	CO	VOC	SOx	PM_{10}
Clark County Emissions	0.18	0.02	0.01	0.00	0.33
Lincoln County Emissions	2.81	0.55	0.15	0.03	20.19
Total Emissions	2.99	0.58	0.15	0.03	20.52

The activities and emissions that would occur under the proposed exercises would not conflict with or obstruct implementation of the current CCDAQM Nonattainment Area Plans or other relevant portions of the State of Nevada SIP. The proposed activities (i.e., transport to rural locations) that would occur within the nonattainment area would be conducted in compliance with all CCDAQM rules and regulations and the emissions from the proposed Radar/Communications activities would occur over a short duration and would not be of a quantity that would significantly contribute to any air quality exceedance within the Las Vegas Valley nonattainment areas or cause any new monitored exceedance of any air quality standard. The proposed Radar/Communications exercises conducted within Lincoln County would not be of a duration or quantity that would affect the attainment status of Lincoln County for any criteria pollutant.

The majority of the emissions associated with the proposed Radar/Communications exercises would occur either in transit, which limits the impact at any one location, or would occur at remote sites in Lincoln County that should not have the potential to expose sensitive receptors to substantial concentrations of pollutants. There may be the potential for short-term adverse impacts to recreational users and a few area residents due to emissions accumulating during low level temperature inversions, or from dust emissions that may occur during convoy travel on unpaved roads. Additionally, at a few of the proposed Radar/Communications locations, the potential for dust emissions may be exacerbated by

the fine soil conditions that occur (i.e., near dry lake beds). However, SOPs, such as limiting engine idling to essential activities and keeping all vehicle speed within posted speed limits or Army doctrinal convoy speeds (see Appendix B for full descriptions of SOPs), would reduce, to the extent feasible, the related emission potential, particularly diesel idling emissions and fugitive dust emissions from travel on unpaved road surfaces.

The emissions from the proposed Radar/Communications activities, within the Las Vegas Valley PM10 and CO nonattainment areas, are well below the General Conformity Rule *de minimis* annual emission threshold of 70 tons per year of PM10 and 100 tons per year of CO. Please refer to Appendix C for the complete conformity analysis. County specific emissions were developed for the proposed Radar/Communications activities in order to complete the conformity determination. Only the Proposed Action undergoes a conformity determination.

4.1.3 Alternative A: No Action Alternative

Under the No Action Alternative, the 15-year CUL would not be granted by the BLM and impacts associated with the proposed action would not occur. Therefore, implementation of the No Action Alternative would not result in any air quality impacts. However, this alternative would not allow the NTTR to develop an IADS to train both ground and air systems against a full spectrum battlefield environment, which would result in the loss of realistic ground-to-air combat condition training, reduce the theater coordination required to reduce fratricide, and delay system upgrades to electronic air defense systems.

4.2 BIOLOGICAL RESOURCES

4.2.1 Significance Criteria

Direct impacts would occur when sensitive biological resources are altered, disturbed, destroyed, or removed during the course of the proposed exercises. Direct impacts would result from such activities as removal or brushing of vegetation, or mechanical crushing from equipment and vehicles. Other direct impacts could include the loss of foraging, nesting, or burrowing habitat for wildlife species, and habitat disturbance that results in unfavorable substrate conditions to allow vegetative regeneration or results in the introduction of exotic invasive species.

Indirect impacts occur when exercise-related activities affect biological resources in a manner other than direct impacts. Potential indirect impacts resulting from implementation of the proposed exercises include elevated noise levels, light conflicts, increased erosion and sedimentation, or the spread of noxious and non-native invasive weeds. These changes may in turn affect vegetation communities and sensitive species that could be present in the region.

Both direct and indirect impacts can be classified as either temporary or permanent, depending on the duration of the impact. Temporary impacts may be considered to have reversible effects on biological resources. Permanent impacts are those impacts resulting in the irreversible removal of biological resources.

4.2.2 Proposed Action

Activities that could result in impacts to biological resources in the exercise area and at each of the proposed Radar/Communications sites include the placement of equipment and personnel, training activities, and off-road vehicle use to gain access to the sites. Overland travel impacts required to position equipment at each site would vary in magnitude depending on variables such as vegetation type, soil morphology, topography, unit size, and types of vehicles. The proposed Radar/Communications exercises could result in temporary damage to existing vegetation, but would not involve the removal or substantial disruption of surface soil layers. The most common type of surface disturbance would be caused by rubber-tired vehicles moving onto the sites in order to move personnel and equipment into the activity area. Existing vegetation would be crushed in place and the root system left intact. However, while the removal of vegetation would be limited at any location, habitat present at each Radar/Communications site would be subject to routine disturbance and would likely degrade over the proposed 15-year period of the exercises.

In total, the sites cover a maximum area of 79.8 acres, most of which has been subject to previous disturbance. Sentinel units would remain on existing access roads and are expected to have limited potential for disturbance. The LSA would be located on the dirt airfield west of Alamo, and would not result in impacts to vegetation or habitat.

4.2.2.1 Vegetation

Each of the proposed Radar/Communications sites consists of up to 5.7 acres of vegetation. These sites were selected by the BLM/USAF based on the level of disturbance and general characteristics of the sites. Potential impacts to vegetation at each Radar/Communications site would be different based on existing biological conditions and equipment use. Most of the vegetation located on the proposed Radar/Communications sites consists of common plant communities that are not regionally unique and are widespread throughout the proposed exercise area. Several of the proposed Radar/Communications sites are located in previously disturbed areas, such as the dirt airfield at site 108 and the LSA. In addition, Radar/Communications sites 103, 102, 112E, and 110F occur in previously disturbed areas and playas to limit impacts to biological resources. Other sites contain populations of disturbed habitat dominated by invasive plant species such as Russian thistle. Although some of the sites occur in areas that support grazing opportunities, only a limited portion of any site would be disturbed by the proposed Radar/Communications exercises. Vegetation communities on each of the proposed Radar/Communications sites and adjacent to the LSA have been identified in Section 3.2.

Sentinel units would limit activity to within existing roads or two-tracks and would not disturb vegetated areas. Sentinel units would bivouac only at the designated Radar/Communications sites or the LSA.

Due to the measures incorporated into the proposed Radar/Communications activity project description, the SOPs detailed in Appendix B (no digging, site inspections, after action review by BLM to determine restoration requirements if needed, and environmental training), the implementation of the environmental criteria (avoid impacts to cacti and Joshua trees), and the relative abundance of these

vegetation communities in the region, impacts to vegetation located at each Radar/Communications site would be minor and would not result in adverse impacts to native vegetation communities.

Noxious and Non-Native Weeds

Implementation of the proposed Radar/Communications exercises could result in the potential to increase the spread of noxious and non-native weeds at the proposed sites and in areas traversed by Sentinel units. Disturbance from vehicles and equipment could result in the spread of invasive species such as Russian thistle, halogeton, and brome grasses. Noxious and non-native weeds could also spread to other areas by vehicle use in areas that may contain populations of noxious and non-native weeds. Although no plants listed on the noxious weed list were identified at the proposed Radar/Communications sites, populations of noxious and non-native weeds have been identified by the BLM as occurring in the area (BLM, 2007b). Through the implementation of BLM weed measures and SOPs (see Appendix B for full descriptions of SOPs), including the identification and flagging of populations of noxious and non-native weeds for avoidance, post inspection by the BLM, and seeding with native species if required, impacts from the spread of noxious and non-native weeds would be minimized or avoided. In addition, all vehicles and heavy equipment used for the proposed Radar/Communications exercises that are authorized for off-road driving, or that come into contact with plant species listed on the Nevada Noxious Weed list or specifically identified by the BLM Ely Field Office, would be cleaned prior to continued use in weed-free areas. If the spread of noxious and non-native weeds is noted, appropriate weed control procedures would be determined in consultation with the BLM. Any remedial actions undertaken would be in compliance with the appropriate BLM Handbook sections and applicable laws and regulations.

Wetlands and Riparian Habitat

Ground activities associated with the proposed Radar/Communications exercises would not occur within one-quarter mile of riparian or wetland habitat. In addition, no activities would be conducted in standing or ponded water (see Section 4.3, Water Resources and Hydrology).

Wilderness Areas and Areas of Critical Environmental Concern

Ground activities associated with the proposed exercises would not occur in designated wilderness areas or areas of critical environmental concern. No impacts to these resources would occur.

4.2.2.2 Wildlife

Implementation of the proposed Radar/Communications exercises has the potential to temporarily disrupt wildlife habitat by the introduction of military equipment onto the proposed sites. The primary form of disturbance would result from crushed vegetation and potential loss of individual animals such as small mammals and reptiles. This type of disturbance would most likely affect wildlife in Basin sagebrush, blackbrush, and salt scrub communities. However, use of the proposed Radar/Communications sites would be of short duration, some of the sites are already highly disturbed or provide minimal foraging value, and potential activity-related disturbance would occur in a limited area (i.e. approximately 5.7 acres per site with only three sites impacted per exercise). With the

exception of some small mammals and reptiles, most species would likely move to adjacent habitat during the proposed exercises. Large mammals, including, antelope, mule deer and coyotes, are wide ranging species and would not be adversely affected by the proposed exercises. Therefore, impacts to existing wildlife would be minimal.

Indirect impacts resulting from human disturbance at the proposed Radar/Communications sites could cause displacement of some wildlife to other habitats. Elevated noise levels, light from stationary equipment, and the production of fugitive dust emissions could also occur. However, it should be noted that the majority of the noise in the project area would occur from the ongoing air exercises. Burrows could also be disturbed and abandoned as a result of increased human disturbance; although, most of the proposed Radar/Communications sites are located in areas that support common species. Impacts to small mammals and reptiles, while adverse, would be limited to very small areas associated with the proposed sites and Sentinel units.

Wild Horses

Wild horses could be temporarily affected by the placement or movement of Radar/Communications units that occurs in or adjacent to the HMA's. Only two sites (110F and 110E) are located in a designated HMA. The other sites located in the Coal Valley and Dry Lake Valleys could be utilized by wild horses but the units would be emplaced for only limited periods of time and would not prevent access to other foraging or watering areas. Mobile Sentinel units could travel in the Dry Lake, Seaman, Rattlesnake and Delamar Valley HMA. No other HMA would be affected by the proposed Radar/Communications exercises. It is possible that a small number of wild horses could be temporarily disturbed during implementation of the proposed exercises. In addition, the exercises could occur during the foaling season for wild horses. The exercises, however, would not result in a permanent loss or disruption of foraging land for wild horses. To reduce the potential for disturbance to wild horses, all personnel conducting the exercises would be advised to reduce speeds if wild horses are observed along the access roads. Due to the wary nature of wild horses, the short duration of the exercises, and the large geographic region, it is not expected that the proposed Radar/Communications exercises would adversely affect wild horses.

Migratory Birds

Exercise activities conducted during the breeding period for migratory birds have the potential to impact ground nesting species should they be present at the proposed Radar/Communications sites. To comply with BLM requirements and avoid impacts to species protected by the Migratory Bird Treaty Act, nesting surveys for migratory bird species would be conducted prior to emplacement of equipment in areas that would support nesting birds (see SOPs in Appendix B).

4.2.2.3 Special Status Species

Vegetation

Threatened or endangered plants were not observed at the proposed Radar/Communications sites during the biological surveys (29-31 October 2007, 5-7 November, and 6 December 2007), nor are any

expected to occur at the proposed Radar/Communications sites. Most of the sites are subject to grazing and were selected by the USAF and BLM because of the sites have been subject to previous disturbance. Nine special status plants have the potential to occur in the exercise area, but only three are likely to occur on any of the proposed Radar/Communications sites. It is unlikely that the proposed Radar/Communications exercises would impact substantial populations of rare plants, if present, as the areas are previously disturbed and have limited potential to support rare species. Therefore, impacts to sensitive plant species that could occur in the proposed exercise area may be adverse but would be localized and limited to small areas.

Wildlife

Implementation of the proposed action would not result in impacts to federally listed species as none were identified at the proposed Radar/Communications sites. Desert tortoise are known to occur in the vicinity of the LSA; however, the site and adjacent habitat are not likely to support this species. Protocol level surveys for desert tortoise conducted at the proposed LSA site and the LSA access road for the 2005 Red Flag activities did not detect the presence of this species. The USFWS issued a Biological Opinion for the Joint Red Flag '05 Exercise as project activities were conducted in portions of the Delamar Valley that supported desert tortoise. BLM has also indicated that the area surrounding the site lacks the primary constituent elements required for occupation and project activities would not occur in off-road sections within desert tortoise habitat. However, it is possible that a tortoise could move into the region. By implementing SOPs (see Appendix B for full descriptions of SOPs) such as presentation of a tortoise education program, ceasing activities that could endanger a tortoise if one is found, and checking beneath vehicles and equipment before moving them, would avoid impacts to desert tortoise.

Pygmy rabbit may occur in the northern sections of the Sand Springs, Coal, and Garden Valleys. Pygmy rabbit is being considered for listing by the USFWS, and if listed, Critical Habitat for this species will also be designated. It is unknown at this time where the designated Critical Habitat would be located, therefore, project impacts to Critical Habitat for the pygmy rabbit are unknown. It is known, however, that this species forages and utilizes Basin sagebrush communities and, if present, could be temporarily displaced from the Radar/Communications sites. Only one site(112C) contains this habitat type.

Several species identified by the BLM and NDOW are also known to occur in the proposed exercise area, including the burrowing owl, dark kangaroo mouse, and Gila monster. Burrowing owls could occur near site 112G due to the presence of various burrows. If present, impacts to this species would be considered potentially significant. The use of SOPs, such as *Protecting Burrowing Owls at Construction Sites in Nevada's Mojave Desert Region,* have been incorporated into the project to avoid impacts to this species (see Appendix B for full descriptions of SOPs). Dark kangaroo mouse is also known to occur in the region and would be subject to disturbance from exercise activities that could crush individuals or burrows if present at a Radar/Communication site. Habitat utilized for foraging and burrowing by these species is abundant locally and regionally; therefore, project activities would not jeopardize local populations of these species. Gila monster has a low potential to occur in the project

region, but if present, would be subject to disturbance from exercise activities that could crush individuals or burrows. SOPs such as following the document *Gila Monster Protocol for Minimizing Impacts in the Construction Site* have been incorporated into the project to minimize impacts to this species (see Appendix B for full descriptions of SOPs).

4.2.3 Alternative A: No Action Alternative

Under the No Action Alternative, the proposed Radar/Communication exercises would not be conducted and potential impacts to biological resources would not occur. As described above this alternative would not allow the NTTR to develop an IADS to train both ground and air systems and would result in the loss of realistic ground-to-air combat condition training.

4.3 WATER RESOURCES AND HYDROLOGY

4.3.1 Significance Criteria

An impact to water resources would be significant if it would (1) reduce water availability to or interfere with the supply of existing users, (2) create or contribute to overdraft of groundwater basins or exceed safe annual yield of water supply sources, (3) adversely affect water quality or endanger public health by creating or worsening adverse health hazard conditions, or (4) violate established laws or regulations that have been adopted to protect or manage water resources of an area.

4.3.2 Proposed Action

Ground activities associated with the proposed Radar/Communications exercises have the potential to affect water resources in the region. Activities include temporary disturbance to soil and dirt roadways, and the on-site use and storage of fuel at each of the proposed Radar/Communications sites and the LSA site. Other potential impacts to water resources could occur from refueling vehicles or equipment, particularly mobile Sentinel units and generators, and the use of solvents or cleaning agents during routine maintenance of equipment. No discharge of gray water from mobile kitchens or shower facilities would occur, although small amounts of wash water for personal hygiene could be discharged (43 CFR 8365.1-1).

As described in Section 3.3.1, most of the proposed sites are located along the valley floors or playas that exist throughout the region. Many of these areas contain small ephemeral drainages, dry washes, or gullies that could support temporary flows during periods of rainfall. However, for most of the year these areas do not support flowing water. Activities that occur during periods of rainfall could potentially transport minor fuel leaks and spills into adjacent surface waters, including ephemeral streams and dry lakes. Although some of the proposed sites are located near or within hydrologic features, the implementation of SOPs during project operations would avoid or minimize impacts to water resources and hydrology. These SOPs (see Appendix B for full descriptions of SOPs) include avoidance of riparian areas, containment and proper disposal of wastewater and hazardous substances, avoidance of any area containing ponded or flowing water, and use of containment berms in fueling areas.

As described in Section 3.4.2, the rock underlying much of the area of the region consists of permeable Cenozoic basin-fill and carbonate rock. These geologic features are characterized by solution cavities or fractures that can transport pollutants quickly through the rock layers into an aquifer. Many of the soils in the area are permeable, so liquids from the surface would move quickly through the soil and into the underlying rocks, increasing the potential of groundwater contamination. Implementation of SOPs (see Appendix B for full descriptions of SOPs), such as having personnel remain at least a quarter mile from riparian water sources, avoiding Radar/Communications sites if ponded or flowing water are present, and not disposing of gray water, would avoid the potential to contaminate ground water resources.

4.3.3 Alternative A: No Action Alternative

Under the No Action Alternative, the proposed Radar/Communications exercises would not be conducted. Potential impacts to water resources would not occur. This alternative would not allow the NTTR to develop an IADS to train both ground and air systems and would result in the loss of realistic ground-to-air combat training.

4.4 EARTH RESOURCES

4.4.1 Significance Criteria

Protection of unique geologic features and minimization of soil erosion are considered when evaluating impacts of the proposed Radar/Communications exercises on geological resources, as well as limitations due to potential geologic hazards. The proposed Radar/Communications exercises would be considered significant if they were located on a geologic unit or soil that is unstable, or that would become unstable as a result of the activities, and potentially result in a landslide, lateral spreading, subsidence, liquefaction, or collapse.

4.4.2 Proposed Action

Implementation of the proposed Radar/Communications exercises could result in temporary impacts to soil surfaces from the emplacement of vehicles and equipment at the proposed sites. Many soils in the region are susceptible to wind and/or water erosion and are not resilient to repeated disturbance. In some arid regions, soils are covered by a thin microphytic crust consisting of a thin layer of mosses, lichens, and other non-flowering vegetation that can be impacted by mechanical disturbance. Erosion potential is also generally more severe on sites containing steep, sparsely vegetated slopes, fine sandy or silty soils, and in loose soils where high winds occur. Loss or severe degradation of vegetative cover could also increase the erosion potential at a given location.

Radar/Communications exercises have the potential to increase soil erosion to a limited degree at the proposed sites. To minimize erosion potential, most of the proposed sites were selected in locations such as flat or gently sloping areas containing populations of disturbed vegetation or compacted soils. Implementation of SOPs (see Appendix B for full descriptions of SOPs), such as no digging or other earth moving activities, and restoration of sites including reseeding or other methods in consultation with the BLM, would minimize soil erosion impacts resulting from the proposed activities.

Three of the Radar/Communications sites (112 G, 110G, and 102) occur in areas that could potentially be classified as Prime Farmland provided the sites were taken to irrigated and reclaimed from excess salts. However, none of these sites has historically or currently been used as farmland and the proposed exercises would not preclude future use of the land for agriculture.

4.4.3 Alternative A: No Action Alternative

Under the No Action Alternative, the proposed Radar/Communications exercises would not be conducted. Potential impacts to earth resources would not occur. This alternative would not allow the NTTR to develop an IADS to train both ground and air systems and would result in the loss of realistic ground-to-air combat training.

4.5 LAND USE

4.5.1 Significance Criteria

Significance of potential land use impacts is based on the level of land use sensitivity in areas affected by the proposed Radar/Communications exercises. In general, land use impacts could be significant if they would (1) be inconsistent or in noncompliance with applicable land use plans or policies, (2) preclude the viability of existing land use, (3) preclude continued use or occupation of an area, or (4) be incompatible with land uses adjacent to or in the vicinity of the Proposed Action to the extent that public health or safety is threatened.

4.5.2 Proposed Action

Implementation of the Proposed Action would not result in a change of land use for the region. The sites are located in rural areas located throughout Lincoln County on public lands administered by the BLM. The proposed Radar/Communications exercises are short-term in nature and would impact a relatively small area (i.e. 79.8 acres) compared to the geographic region. With the exception of the LSA (Alamo Landing Field) the proposed sites would be located in remote areas, and on public lands designated for livestock grazing and/or recreational activities. As the proposed exercises would temporarily result in military activities occurring in conjunction with other land uses, the BLM would require a CUL agreement from the USAF.

During the proposed exercises, Sentinel units could potentially stop near various rural communities, including Alamo, Rachel, Hiko, and Crystal Springs. However, mobile Sentinel units would remain for a limited time period, would not disturb existing facilities, and would not result in a substantial change to the existing environmental setting. These activities are consistent with the land use objectives identified for the area.

The LSA is located approximately one mile west of the community of Alamo, at the Alamo Landing Field. Sensitive receptors that may be affected by the proposed Radar/Communications exercise would include the Pahranagat Valley Senior Citizens Center located on Airport Road, the Pahranagat Valley Middle School located on 1st Street South, and residences located along Broadway. Potential impacts to these sensitive receptors could occur from noise or traffic generated during the proposed

Radar/Communications exercises. In order to reduce potential impacts to the residents of Alamo, the USAF would post announcement notices of the proposed Radar/Communications exercises within the community of Alamo. With the incorporation of these elements into the proposed activities, potential impacts to nearby receptors would be minimized.

4.5.3 Alternative A: No Action Alternative

Under the No Action Alternative, the proposed exercises would not be conducted. There would be no impact to existing land uses. This alternative would not allow the NTTR to develop an IADS to train both ground and air systems and would result in the loss of realistic ground-to-air combat training.

4.6 AESTHETICS

4.6.1 Significance Criteria

Determination of the significance of impacts to visual resources is based on the level of visual sensitivity in an area. Visual sensitivity is defined as the degree of public interest in a visual resource and concern over adverse changes in the quality of that resource. In general, an impact to a visual resource is significant if implementation of the proposed Radar/Communications exercises would result in a substantial alteration to an existing sensitive visual character or setting.

4.6.2 Proposed Action

The proposed Radar/Communications exercises would generally be located in rural settings away from populated areas. The exception is the LSA, which would be emplaced approximately one mile west of the community of Alamo at the Alamo Landing Field. Access to the Alamo Landing Field would be visible to residents during the proposed exercises. Sentinel units could also be located in close proximity to the major travel corridors in the region or near the various communities in the exercise activity area, such as Alamo, Rachel, Hiko, or Crystal Springs. The visual impact on motorists traveling these corridors would be greatest when the Sentinel units are located in the foreground viewing-distance zone.

Although some of the proposed Radar/Communications sites may be visible to the public, they are located on public land administered by the BLM that is classified as VRM IV. Under the Class IV management guidelines, substantial modifications to the viewscape can occur and activities may dominate the view and be the major focus of viewer attention.

The proposed Radar/Communications exercises would not permanently alter the veiwscape, would be of short duration, and would occur in primarily rural areas; therefore, no permanent impacts to visual resources would occur. Implementation of the proposed radar/Communications exercises would be consistent with established BLM VRM Class IV management objectives and would not result in impacts to visual resources.

4.6.3 Alternative A: No Action Alternative

Under the No Action Alternative, the proposed Radar/Communications exercises would not be conducted. There would be no impact to visual resources. Implementation of this alternative would not

allow the NTTR to develop an IADS to train both ground and air systems and would result in the loss of realistic ground-to-air combat training.

4.7 RECREATION

4.7.1 Significance Criteria

Recreation impacts would be considered significant if they would result in permanent or long-term preclusion of a recreational area, temporarily preclude use of an area during a peak recreational season, result in long-term loss or degradation of the recreational value of a major recreational facility, or conflict with an established use of an area.

The proposed Radar/Communications exercises would be located in the vicinity of several recreational facilities, which are described in Section 3.7. While the proposed Radar/Communications exercises would not be located on these facilities, military activities could potentially result in the temporary degradation of recreational opportunities in the region. The following discussion identifies the potential effects of the proposed activities on existing recreational activities.

4.7.2 Proposed Action

The proposed Radar/Communications sites are located on public land administered by the BLM that is used for a number of recreational activities including hunting, off-road vehicle use, mountain biking, and hiking. The proposed Radar/Communications exercises would not restrict access to recreational facilities and would have no impact on the use of these facilities. Activities associated with the Proposed Action could result in a short-term disruption to recreation users seeking access to remote and rarely utilized scenic areas; however, the proposed Radar/Communications exercises would be of limited duration and would not limit access to the region. Subsequently, impacts to recreational users would be temporary and not result in permanent loss of recreational facilities.

4.7.3 Alternative A: No Action Alternative

Under the No Action Alternative, the proposed Radar/Communications exercises would not be conducted. There would be no impact to recreational facilities. Implementation of this alternative would not allow the NTTR to develop an IADS to train both ground and air systems against a full spectrum battlefield environment which would result in the loss of realistic ground-to-air combat training.

4.8 NOISE

4.8.1 Proposed Action

The proposed Radar/Communications exercises, would introduce ground-based military exercise activities onto public lands administered by the BLM surrounding Nellis AFB. Consequently, the proposed exercise would have the potential to temporarily increase noise in the areas in which ground activities would occur. Noise sources include logistics-related operations required to bring troops and equipment to the various sites, noise from equipment (e.g., generators), and noise resulting from deployment and other exercise-related activities in the field. Some disturbance to animals grazing

nearby, and residences of the surrounding communities (Alamo, Crystal Springs, Hiko, and Rachel), could temporarily occur as a result of increased noise levels. However, most of the noise associated with the proposed ground-based activities is anticipated to be at relatively low levels, temporary (approximately 21 days per exercise), and would generally occur in rural, unpopulated areas several miles from sensitive noise receptors. The exception to this would be the LSA site located in the community of Alamo and a small home located north of SR 375 in the Sand Springs Valley.

To reduce noise impacts associated with the use of the LSA, the Radar/Communications units would access the LSA to avoid sensitive receptors. Travel to the LSA would occur via Broadway to 1st Street West to Airport Road, unless otherwise directed by local law enforcement, and would be limited to daylight hours to the extent feasible. 1st Street South would not be used to access the LSA to minimize potential noise impacts to Pahranagat Middle School. The small home located north of SR 375 does not occur within several miles of a proposed Radar/Communications site, but could be subject to periodic vehicle traffic if troops use the dirt road that passes this home .

4.8.2 Alternative A: No Action Alternative

Under the No Action Alternative, the proposed exercises would not be conducted. There would be no impacts from noise to sensitive receptors. Implementation of this alternative would not allow the NTTR to develop an IADS to train both ground and air systems and would result in the loss of realistic ground-to-air combat training.

4.9 SOCIOECONOMICS

4.9.1 Significance Criteria

The significance of population and expenditure impacts are assessed in terms of their direct effect on the local economy and related effect on other socioeconomic resources (e.g., housing). The magnitude of potential impacts can vary greatly depending on the location of the Proposed Action. If implementation of a Proposed Action would result in substantial shifts in population trends, adversely affect regional spending and earning patterns, or introduce overwhelming demand for public services or utilities, socioeconomic impacts would be considered significant.

Impacts regarding environmental justice are evaluated by considering how potential impacts resulting from implementation of the proposed Radar/Communications exercises could affect nearby populations. Characteristics of potentially affected populations are evaluated to determine whether minority or low-income communities would be disproportionately affected components of a specific action. A significant impact with regard to environmental justice would occur if a disproportionate number of minority or low income communities were adversely affected by implementation of the proposed exercises.

Potential socioeconomic impacts resulting from the proposed exercises could affect the unincorporated communities of Lincoln County. The following discussion identifies the potential socioeconomic effects of the proposed military activities on the communities within the vicinity of the proposed Radar/Communications exercises.

4.9.2 Proposed Action

The proposed Radar/Communications exercises would primarily occur in Lincoln County, which is the least urbanized and has the greatest unemployment rate of the southeastern counties (see Section 3.9). The proposed Radar/Communications exercises are short in duration, and would only involve military personnel in preparing and conducting the activities. Implementation of the proposed Radar/Communications exercises would neither place a demand on employment opportunities, housing, or public facilities, nor would it create new employment opportunities, housing, or public facilities in the region. Due to the distance to the nearest community, no disproportionate impacts to people of any ethnicity, income level, or age are anticipated from the Proposed Action. Consequently, the proposed Radar/Communications exercises would not create socioeconomic or environmental justice impacts within the adjacent communities and no perceptible impacts would occur.

Since the proposed Radar/Communications exercises would be conducted under Nellis managed airspace, north of the Moapa River Indian Reservation, the project would not impact tribal lands.

4.9.3 Alternative A: No Action Alternative

Under the No Action Alternative, the proposed Radar/Communications exercises would not be conducted. Socioeconomic impacts to communities in the region would not occur. This alternative would not allow the NTTR to develop an IADS to train both ground and air systems against a full spectrum battlefield environment which would result in the loss of realistic ground-to-air combat training. This training is required to reduce fratricide and allow for system upgrades to electronic air defense systems.

4.10 TRANSPORTATION

4.10.1 Significance Criteria

Impacts to transportation and circulation are assessed with respect to the potential for disruption or improvement of current transportation patterns and systems, deterioration or improvement to existing levels of service, and changes in existing levels of transportation safety during construction or operation of a project. Impacts may arise from physical changes to circulation (e.g., closing, rerouting, or establishing roads), military activity and introduction of military-related traffic on local roads, or changes in daily or peak hour traffic volumes created by either direct or indirect workforce and population changes relative to surrounding activities. The proposed exercises would have a significant impact on transportation if they were to cause closures of major roadways, restrict access to or from adjacent lands, or restrict the movements of emergency vehicles.

4.10.2 Proposed Action

The proposed Radar/Communications exercises would introduce military activities onto public lands administered by the BLM surrounding Nellis AFB. The increased ground activities on public lands could potentially increase traffic in those areas. This section assesses anticipated traffic impacts from ground-related exercise operations. Traffic would temporarily increase during deployment, operations,

and demobilization phases of the proposed exercises. Potential issues include additional congestion on local roadways, and delays for highway travelers caused by a slow moving convoy.

During initial deployment of equipment and personnel, military equipment would begin at Nellis AFB in North Las Vegas and head to the proposed exercise area in Lincoln County. Traffic volumes would increase on the local roadways between Nellis AFB and U.S. Highway 93. Approximately 75 vehicles consisting of HMMWVs, mid-sized trucks, heavy trucks, and towed radar units would travel from Nellis AFB to the proposed Radar/Communications sites in Lincoln County. The addition of this equipment would constitute a less than three percent increase on the use of roadways in the project region. Therefore, the increase on the roadways between Nellis AFB and U.S. Highway 93 would be minimal. However, increased traffic leaving Nellis AFB could have the potential to disrupt traffic on Nellis Boulevard, Las Vegas Boulevard and on U.S. Highway 93 as the convoy leaves Clark County. Impacts would be reduced by scheduling the convoy to avoid traveling in urban areas during peak traffic hours.

The proposed Radar/Communications exercises would slightly increase traffic along U.S. Highway 93 in Lincoln County. Traffic volumes on U.S. Highway 93 (Station 1) would increase approximately six percent, which would have only a minor impact on the existing good level of service on this highway. Use of the rural, unpaved (dirt) roads, throughout the exercise area would not effect traffic as vehicle use is extremely low.

Implementation of the proposed Radar/Communications exercises would not require the closure of any roadways, would not substantially disrupt current transportation patterns and systems, would not degrade existing levels of service, would not limit access to or from adjacent land uses, and would not restrict emergency vehicle access.

4.10.3 Alternative A: No Action Alternative

Under the No Action Alternative, the proposed Radar/Communications exercises would not be conducted. Therefore no impact to transportation would occur. However, this alternative would not allow the NTTR to develop an IADS which is required to train both ground and air systems and would result in the loss of realistic ground-to-air combat training.

4.11 HAZARDOUS AND TOXIC SUBSTANCES

4.11.1 Proposed Action

The proposed Radar/Communications sites would not be located in areas where hazardous materials have been identified (see Section 3.11). However, hazardous materials would be used during the proposed activities to operate the Radar/Communications units, generators, mobile field kitchens, HMMWVs, portable toilets, etc. Fuel would also be stored on the proposed sites for the duration of the exercises. Radar/Communications units would be serviced by fuel trucks during the proposed activities. Copper grounding rods may also be used to ground electrical equipment. These rods, if used, would be

removed at the conclusion of the exercise, thereby avoiding hazards to vehicle tires, people, and animals, as well as reducing the potential of introducing copper into the environment.

The relatively small quantity of hazardous materials involved in the proposed Radar/Communications exercises would not be expected to pose a significant public health and safety hazard through release of emissions or risk of upset. However, safety risks associated with the use of hazardous materials would exist. These safety risks would be reduced through established hazardous materials and waste management and spill prevention, control, and countermeasure procedures employed at participating military installations to preclude adverse impacts. Additionally, the use of a HAZMART would help to identify the least hazardous product appropriate for the task, provide for proper labeling of materials, and provide instructions on handling of hazardous materials. Safety risks would be further reduced with implementation of SOPs (see Appendix B for full descriptions of SOPs), such as no digging at the field sites, placing drip pans under all parked vehicles, using containment berms for re-fueling trucks, and using portable containment pallets for all liquid POL, hazardous materials, and hazardous waste containers.

4.11.2 Alternative A: No Action Alternative

Under the No Action Alternative, the proposed Radar/Communications exercises would not be conducted. Therefore impacts from the release of hazardous material would not occur. However, this alternative would not allow the NTTR to develop an IADS which is required to train both ground and air systems and would result in the loss of realistic ground-to-air combat training.

4.12 SAFETY

4.12.1 Proposed Action

Fire Risk and Management/Ground Safety

The proposed Radar/Communications exercises would result in small concentrations of personnel and equipment at various sites located on public land administered by the BLM for a brief period of time (approximately 21 days per exercise). All ground-operations to be performed during the proposed Radar/Communications exercises are currently performed in day-to-day training. The proposed exercises would include implementing existing processes and procedures that ensure safety during ongoing operations and would continue to ensure safety during the proposed activities. For example, all vehicles deployed to field sites are furnished with spark arresters on their mufflers to reduce fire risk. Additionally, local fire departments would be alerted by the USAF prior to field deployment. Furthermore, SOPs (see Appendix B for full descriptions of SOPs), such as USAF approval of relocation of Sentinel units, documentation of any environmental violation, and coordination between USAF, US Army, and BLM for reclamation activities, as required, upon completion of the exercise, as well as not using live or blank ammunition, would help minimize ground safety and fire risk.

Military operations conducted during the proposed Radar/Communications exercises will be performed in accordance with applicable Air Force safety regulations, published Air Force Technical Orders, and standards prescribed by Air Force Occupational Safety and Health (AFOSH) requirements.

Radio Frequency Emissions

Radars would be located throughout the proposed activity area. Acceptable energy levels and safe separation distances for persons vary depending on the frequency and transmitted power of the RF emitter. For the emitters used on the NTTR, calculations have been performed to determine the required separation distances for persons. These data are presented in Table 4.12-1. When a system operates across a band of frequencies, the range of separation distances is shown.

Table 4.12-1. Emitter Safe-Separation Distances

Equipment	Distance, Meters (in Feet)	Equipment	Distance, Meters (in Feet)
AN/MPQ-T3	19 – 24 (62 – 78)	AN/TPT-4	16 – 18 (53 – 58)
AN/MPS-14	239 (783)	AN/TPT-T1V,1A	36 (118)
AN/MPS-T19	132 (432)	AN/TPT-T1V,1B	40 (131)
AN/MSQ-T13	39 – 73 (127 – 239)	AN/TPT-T1V,2A	45 (146)
AN/MSQ-T43	54 – 59 (176 – 194)	AN/TPT-T1V,2B	17 (57)
AN/MPS-T1	0.6 – 77 (2 – 252)	AN/MSQ-77	28 (93)
AN/VPQ-1	6.4 (21)		

Source: USAF, 1999

The majority of this equipment is aircraft threat simulation radar. Frequency management ensures that these transmitters do not create interference with other Federal or civil transmitters or receivers. The unit is normally placed on elevated ground, and then emits skyward. It is not pointed at the ground or along roadways. This equipment is operated under strict safety control measures that are determined for each system. These measures include installing warning signs, erecting rope or chain barriers, and having the equipment and the surrounding area under constant observation while it is operating. Adherence to these established safety standards ensures that no health or safety impacts would occur. Additionally, RF emitters used on aircraft pose no hazard to the public due to the aircraft's altitude, the energy levels used by the equipment, and the speed of the aircraft. Given these factors, the duration of any possible RF energy exposure is very small if such exposure were even to occur.

Hazardous Materials and Solid Waste

The Radar/Communications sites identified for the proposed exercises would not be located in areas where hazardous materials have been identified. However, hazardous materials would be used during the proposed exercises to operate the Patriot, Avenger and Sentinel units, generators, mobile field kitchens, HMMWVs, portable toilets, etc. Fuel would also be stored on Patriot sites and at the LSA for the duration of the proposed exercises. Avenger and Sentinel units would be serviced by fuel truck up to four times during each exercise. Copper grounding rods may also be used to ground electrical equipment. These rods, if used, would be removed at the conclusion of each exercise, thereby avoiding hazards to vehicle tires, people, and animals, as well as reducing the potential of introducing copper into the environment.

The relatively small quantity of hazardous materials involved in the proposed exercises would not be expected to pose a significant public health and safety hazard through release of emissions or risk of upset. However, safety risks associated with the use of hazardous materials would exist. These safety risks would be reduced through established hazardous materials and waste management and spill

prevention, control, and countermeasure procedures employed at participating military installations to preclude adverse impacts. Additionally, the use of a HAZMART would help to identify the least hazardous product appropriate for the task, provide for proper labeling of materials, and provide instructions on handling of hazardous materials. Safety risks would be further reduced to less-than-significant levels with implementation of SOPs (see Appendix B for full descriptions of SOPs), such as not digging at field sites, removal of trash and debris daily, storing of trash in sealed containers, and use of drip pans under parked vehicles.

4.12.2 Alternative A: No Action Alternative

Under the No Action Alternative, the proposed Radar/Communications exercises would not be conducted. Therefore potential safety impacts would not occur. However, this alternative would not allow the NTTR to develop an IADS which is required to train both ground and air systems and would result in the loss of realistic ground-to-air combat training.

4.13 CULTURAL RESOURCES

Analysis of potential impacts to cultural resources considers both direct and indirect impacts. Direct impacts are those that alter, damage, or destroy all or part of a cultural resources property. This would include elements of the resource's setting contributing to the significance of the resource. Indirect impacts are secondary effects caused by the proposed action that could result in impacts to the resource, such as attracting increased numbers of visitors to the area.

4.13.1 Proposed Action

A cultural resources inventory was completed for the proposed project area and eligibility determinations for nomination to the NHRP were made using criteria established in 36 CFR 60.4. Two archaeological sites were located during the inventory. Site 26Ln5342 is a lithic scatter and determined ineligible. Site 26Ln5341 is a multi-component site comprised of a lithic scatter and historic structure. Recordation is incomplete. The site is considered to possess potential to provide important information to the history of the region and is eligible under criterion (a). Efforts would be taken to ensure avoidance of the eligible property. The boundary of the proposed site near this location was moved 350 meters southwest. The existing road would not be improved for this action; thus, increased traffic would not be an issue. Finally, the USAF would ensure that personnel and equipment would not move outside of the boundaries of the proposed exercise site.

4.13.2 Alternative A: No Action Alternative

Under the No Action Alternative, the proposed exercises would not be conducted. Therefore, impacts to cultural resources would not occur. This alternative would not allow the NTTR to develop an IADS to train both ground and air systems and would result in the loss of realistic ground-to-air combat training.

4.14 UTILITIES

4.14.1 Significance Criteria

Impacts to utilities would be considered significant if existing utility systems would be adversely affected by the proposed Radar/Communications exercises. Any unplanned disruption of utility service or physical impact to existing utility lines would also be considered significant.

4.14.2 Proposed Action

Project activities associated with each of the proposed Radar/Communications sites would not disrupt or result in physical damage to any known utility present in the project region. While the region supports a variety of above- and below-ground utilities, most of the proposed Radar/Communications sites occur in highly rural areas that do not contain utilities. Each of the proposed Radar/ Communications sites is a self-supporting unit equipped with a generator to power all required equipment. Sentinel units utilize battery operated power supplies or are powered directly from the vehicles (HMMWVs). The units do not require an interface with any utilities and would not impact the operation of any known utility system. Therefore, the proposed Radar/Communications exercises would have no impact on utilities.

4.14.3 Alternative A: No Action Alternative

Under the No Action Alternative, the proposed Radar/Communications exercises would not be conducted. No impacts to utilities would occur. This alternative would not allow the NTTR to develop an IADS to train both ground and air systems and would result in the loss of realistic ground-to-air combat training.

4.15 RANGE

4.14.1 Significance Criteria

Impacts to grazing would be considered significant if access to watering sites were restricted by the proposed exercises or project activities prevented access to key graving areas.

4.14.2 Proposed Action

Potential impacts to BLM rangeland could include damage to and the temporary loss of grazing land or the temporary preclusion of ranching activities. In order to avoid impacts to sensitive grazing areas, the USAF and the BLM specifically selected sites that would minimize impacts to grazing, such as pre-existing disturbed sites and playas. This includes sites that contain reduced vegetative cover or areas dominated by invasive non-native species including Russian thistle and brome grasses. To reduce any potential impacts to grazing lands, SOPs would be implemented (see Appendix B for full descriptions of SOPs), such as the notification of permittees who are scheduled to graze in the vicinity of the proposed sites during the proposed exercises, the avoidance of watering sites being utilized by livestock, and the restoration of any site found to have experienced environmental damage within one year of the post-exercise inspection.

As stated above, the proposed sites were selected to minimize potential agricultural land use impacts. Grazing facilities such as corrals and stock tanks, and other restricted areas, were avoided during the site selection process unless approved by BLM. The proposed activities would not preclude access to active water troughs, and military vehicles would avoid livestock by maintaining speeds within posted speed limits (see Appendix B for full descriptions of SOPs). Due to the temporary nature of the proposed activities and the incorporation of the grazing and restoration SOPs, impacts to grazing would be limited.

4.14.3 Alternative A: No Action Alternative

Under the No Action Alternative, the proposed Radar/Communications exercises would not be conducted. No impacts to grazing would occur. This alternative would not allow the NTTR to develop an IADS to train both ground and air systems and would result in the loss of realistic ground-to-air combat training.

SECTION 5.0
CUMULATIVE IMPACTS

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5.0 CUMULATIVE IMPACTS

5.1 INTRODUCTION

Cumulative impacts to environmental resources can result from the relationship of the proposed Radar/Communications exercises to other past, present, and reasonably foreseeable future actions in the proposed exercise area. Cumulative impacts can result from minor, but collectively significant, actions undertaken over a period of time and by various agencies (Federal, state, or local) or private entities. In accordance with NEPA and CEQ regulations, a discussion of cumulative impacts resulting from actions and projects that are proposed, under implementation, or reasonably anticipated to be implemented in the near future is required.

Cumulative environmental impacts are most likely to arise when a relationship exists between a proposed activity and other projects expected to occur in a similar location, time period, and/or involving similar actions. Projects in proximity to the proposed Radar/Communications exercises would be expected to have more potential for a relationship that could result in potential cumulative impacts than those more geographically separated.

Projects considered to have the potential for creating cumulative impacts in association with the proposed activity are identified in Table 5-1. In each instance, the assessment focuses on addressing two fundamental questions: (1) Does a relationship exist such that the impacts from the proposed Radar/Communications exercises might affect or be affected by impacts from other actions?, and (2) If such a relationship exists, then does an assessment reveal any cumulatively considerable impacts not identified when the proposed activity is considered alone?

Table 5-1. Cumulative Projects in the Proposed Radar/Communications Exercise Area

Project Name	Description	General Location
Office of Civilian Radioactive Waste Management (OCRWM), United States Department of Energy (DOE)		
Nevada Rail Transportation Corridor	Proposed for the transport of spent nuclear fuel and high-level radioactive waste to Yucca Mountain in Nye County, Nevada	Corridor would travel northeast from the City of Caliente in Lincoln County towards Panac, then turn west to cross through Dry Lake Valley and continue towards Nye County, traveling north of Weepah Springs WSA, Coal Valley, and Sand Spring Valley, before entering Nye County north of the NTTR.
Private Companies Great Basin LLC 500-kilovolt line		
Southwest Intertie Project Corridor	Proposed 383-mile-long, 400-foot-wide right-of-way utility corridor	The corridor spans the entire length of the BLM Ely District, a distance of 300-plus miles. The corridor also extends from Ely eastward to Delta, in Utah.
Bureau of Land Management (BLM), United States Department of the Interior (DOI)		
Eastern Nevada Landscape Restoration Project (ENLRP)	Aims to restore health to 10 million acres of public lands administered by the BLM Ely Field Office	Lincoln County, White Pine County, and a portion of Nye County

Project Name	Description	General Location
South Nevada Water Authority (SNWA)		
Clark, Lincoln and White Pine Counties Groundwater Development Project	Project to include approximately 327 miles of buried pipelines, five pumping stations, six regulating tanks, one buried storage reservoir, one water treatment facility, and approximately 341 miles of power lines with two primary electrical substations, 5 secondary substations, and four hydroturbine energy recovery facilities. Construction is anticipated to take place between 2009 and 2015, depending on approvals and phasing. The project would convey up to 200,000 acre-feet per year of groundwater from Clark, Lincoln, and White Pine Counties for delivery to Las Vegas Valley and Lincoln County Water District in Coyote Spring Valley.	White Pine County, Lincoln County, Clark County (within Lincoln County: Cave Valley, Dry Lake Valley, Delamar Valley, Coyote Spring Valley)
Coyote Springs Investment LLC (Harvey Whittemore)		
Coyote Springs Development Project	Master planned community on 43,000 acres with plans for more than 150,000 homes to support 240,000 residences. Currently, the project has been cleared to build 49,000 housing units on the 14,000 acres in Clark County. The homes will be built on 7,800 acres, with the remaining 6,200 acres left untouched as habitat for desert tortoise and other sensitive species. A similar conservation area will be carved out of the 29,000 acres to be develop on the Lincoln County side of the line.	Covers 65 square miles of desert along the boundary between Clark and Lincoln Counties, at the junction of U.S. Highway 93 and SR-168, 55 miles north of Las Vegas.
Lincoln County Regional Development Authority (LCRDA)		
Alamo Industrial Park	Site is 392.1 acres in size, with approximately 240 useable acres intended for industrial development	Approximately one-tenth of a mile southeast of the Town of Alamo, along Highway 93 in Lincoln County

5.2 ANALYSIS OF CUMULATIVE IMPACTS

5.2.1 Air Quality

As discussed in Table 5-1, there are other projects that would be in construction or operation near the remote sites in Lincoln County. There are also other projects that would be in construction or operation in Clark County or near the primary travel route from Nellis AFB to the Lincoln County Radar/Communications sites; however, the proposed exercise emissions at any one point during the transit from Nellis AFB to the Lincoln County Radar/Communications sites are minimal and would not create a new significant cumulative air quality impact. Additionally, the proposed Radar/Communications emissions within Nellis AFB and Clark County would constitute a very small amount of the annual emissions for Nellis AFB or for the County, could be considered to be part of the normal baseline for Nellis AFB ground-based emissions. The baseline Nellis AFB complex emission summary for the Nellis area and the NTTR, which includes Lincoln County, is given in Table 5-2.

The aircraft emissions that are associated with the proposed Radar/Communications exercises are considered part of and consistent with normal operation within the NTTR. It can be seen that the proposed Radar/Communications activity emissions are negligible in comparison with the normal

operating emissions at Nellis AFB and within the NTTR, as they are in comparison with the total annual emissions of Clark County as a whole.

Table 5-2. Summary of Baseline Nellis AFB and NTTR Emissions (tons/year)

Location	NOx	CO	VOC	SOx	PM_{10}
Nellis AFB (ground based)	339	1,805	228	34	34
Nellis AFB (aircraft only)	320	839	305	338	30
NTTR (Aircraft Only)	8,983	695	52	214	230

Source: USAF, 1999.

5.2.2 Biological Resources

The proposed exercises would result in minimal impacts to biological resources. Historic activities conducted in the region include a major electrical utility corridor, the Lincoln County fiber optics cable, and rangeland improvements such as repairs to fences, cattle guards, pipelines, troughs, and reservoirs (BLM, 2005). Ongoing activities in the region that could contribute to cumulative impacts include a major rail line, utility corridor, water pipeline, and a master planned community (Coyote Springs). The area would also be subject to continued livestock grazing and periodic maintenance of corrals, fences, and stock tanks. As the proposed Radar/Communications exercises are short-term, any effects on biological resources would most likely be temporary, and would terminate upon completion of the exercise. In order to avoid permanent impacts to biological resources, the proposed Radar/Communications exercises would include restoration of sites that have experienced environmental damage. The USAF would also implement SOPs to avoid impacts to sensitive species, such as the desert tortoise and migratory birds (see Appendix B). Since any impacts associated with the proposed Radar/Communications activities would be short-term and would not substantially affect environmental resources, the proposed Radar/Communications activities would not contribute cumulatively to projects occurring after the completion of the exercise; and therefore, would not be cumulatively significant.

5.2.3 Water Resources and Hydrology

Implementation of the proposed Radar/Communications exercises would result in small and temporary impacts to water resources. The projects identified in Table 5-1 include major activities in the region that could contribute to cumulative impacts including a rail line, utility corridor, water pipeline, and a master planned community (Coyote Springs). In addition, ongoing expansion in the community of Alamo and Caliente are also proposed. Despite these projects cumulative potential effects to water resources are localized and would not combine with any of the projects listed in Table 5-1. Therefore, the proposed Radar/Communications exercises would not result in a cumulatively significant impact ton water resources or hydrology in the region.

5.2.4 Earth Resources

No impacts to geological resources would occur from implementation of the proposed Radar/Communications exercises. The projects identified in Table 5-1 include major activities in the region that could contribute to cumulative impacts including a rail line, utility corridor, water pipeline, and a master planned community (Coyote Springs). As potential effects to soils and geology would be site

specific, the proposed Radar/Communications exercises would not result in significant cumulative impacts in the region.

5.2.5 Land Use

The proposed Radar/Communications exercises would not result in changes to existing land uses. As the proposed Radar/Communications exercises are short-term, any effects on land use would be temporary and would terminate upon completion of the exercise. The proposed Yucca Mountain rail line, the proposed utility corridors, and the master planned community (Coyote Springs) described in Table 5-1 will result in land use changes in several areas of the proposed Radar/Communications exercises region including Sand Springs, Coal, and Dry Lake Valleys. However, the proposed Radar/Communications exercises would not contribute to land use changes from this project. As such, the proposed activities would not contribute to land use impacts; and therefore, would not result in a significant cumulative impact.

5.2.6 Aesthetics

The proposed Radar/Communications exercises would be short term, localized, and would not conflict with BLM visual resource guidelines. The proposed exercises would not contribute to a degradation or alteration of the scenic viewscape, and any potential impacts would cease to occur upon completion of the proposed activity. As such, no cumulative aesthetics impacts would occur.

5.2.7 Recreation

The proposed Radar/Communications exercises would have limited short term impacts to existing recreational uses. Construction of the Yucca Mountain rail line, the proposed utility corridor, the proposed water pipeline, or the master planned community (Coyote Springs) would occur over several years and require large numbers of vehicles and equipment. The small number of vehicles associated with the proposed Radar/Communications exercises and the short duration of the exercise would not create additional impacts to potential recreation users seeking access to remote and rarely utilized scenic areas. The proposed Radar/Communications exercises would not contribute to an incremental effect on recreation and therefore would not result in a significant cumulative impact.

5.2.8 Noise

The proposed Radar/Communications exercises would not result in adverse noise impacts. The primary noise source within the Radar/Communications exercises area is from aircraft overflight originating from Nellis AFB which is considered part of the environmental baseline or existing conditions. The remote location of the sites and short duration of the exercise would not cumulatively contribute to the projects identified in Table 5-1and therefore would not result in a significant cumulative impact.

5.2.9 Socioeconomic

The proposed Radar/Communications exercises would not create socioeconomic impacts to any adjacent communities in the region. As such, the proposed Radar/Communications exercises would not

contribute to an incremental socioeconomic effect and therefore would not result in a significant cumulative impact.

5.2.10 Transportation

Cumulative impacts to transportation could potentially result from implementation of the proposed Radar/Communications exercises. Convoy traffic from Nellis AFB to the proposed exercise area routed along U.S. Highway 93 in conjunction with the large scale infrastructure projects identified in Table 5-1, such as the Coyote Springs development project, could result in increased volumes of traffic in the region. However, the quantity of traffic associated with the proposed Radar/Communications exercises would be minimal and temporary, as the proposed exercises are anticipated to occur only five times per year resulting in a total of 5 round-trips per year between Nellis AFB and Lincoln County. As such, traffic associated with the proposed exercises would only have an impact 10 days out of the year and therefore would not contribute to permanent changes in traffic volumes. Given the short duration of the proposed exercises, cumulative traffic impacts would be less than significant.

5.2.11 Hazardous and Toxic Substances

The proposed Radar/Communications sites would not be located in areas where hazardous materials have been identified. While hazardous materials would be used during the proposed exercises, risks would be reduced through implementation of SOPs (identified in Appendix B). Therefore, impacts associated with the communications exercises hazardous would not result in a significant hazardous and toxic substance impact.

5.2.12 Safety

The proposed action would not result in increased risks to public safety. The remote location of the sites and short duration of the exercise would not cumulatively contribute to the projects identified in Table 5-1. Therefore, safety risks associated with the proposed exercises would not result in a significant cumulative impact.

5.2.13 Cultural Resources

The proposed action would have no adverse effect on cultural resources; therefore, there would be no cumulative impacts to cultural resources.

5.2.14 Utilities

The proposed Radar/Communications exercises would have no impacts on utilities. As such, the proposed exercises would not contribute to an incremental impact on utilities, and therefore would not result in a significant cumulative impact.

5.2.15 Range

The proposed Radar/Communications sites were selected to minimize impacts to grazing. The proposed activities would not preclude access to active water troughs, and military vehicles would avoid livestock

by maintaining speeds within posted speed limits (see Appendix B for full descriptions of SOPs). Due to the temporary nature of the proposed activities and the incorporation of the grazing and restoration SOPs, impacts to grazing would be limited. Therefore, there would be no significant cumulative impacts to grazing.

SECTION 6.0
AGENCY COORDINATION

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For purposes of preparing this EA, the following agencies were consulted:

Agency	Name
Federal	
U.S. Department of Interior Bureau of Land Management	Troy Grooms Bonnie Wagner Alicia Styles Joseph David Jeff Weeks Cynthia Longinetti
State of Nevada	
Public Utilities Commission of Nevada	Mark Harris of the Carson City Office*
Department of Conservation and Natural Resources, Division of Environmental Protection, Bureau of Corrective Actions	Jennifer Carr, Remediation Program*
Department of Conservation and Natural Resources, Division of Environmental Protection, Bureau of Water Pollution and Control	Cliff Lawson*
Department of Conservation and Natural Resources, Nevada Natural Heritage Program	Eric Miskow* Jim Morfield* Ralph Phenix*
Nevada Department of Transportation	Kelley (Overdimensional Permits)*
Nevada Division of Environmental Protection	Randy Phillips, Bureau of Air Pollution Control*
Nevada Division of Wildlife	Christine Klinger* Larry Neal*
Clark County	
Clark County Department of Air Quality Management	Pravin Pema*
Lincoln County	
Lincoln County Building and Planning Department	Kelly Harris* Ken Dixon*

*Persons contacted for 2005 Joint Red Flag 05'ADA Activities Exercise

SECTION 7.0
LIST OF PREPARERS AND REVIEWERS

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7.0 LIST OF PREPARERS AND REVIEWERS

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Name	Sections	Background
Chris Huntley Aspen Environmental Group	Project Manager, Aesthetics, Biological Resources, Land Use, Recreation, Socioeconomics/Environmental Justice, Transportation, Project Description, Alternatives, Cumulative Projects, Agency Coordination	B.A. Biology Years of Experience: 14
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Aubrey Mescher Aspen Environmental Group	Water Resources and Hydrology, Earth Resources (Geology)	Master of Environmental Science and Management B.A. Film Studies and Environmental Science Years of Experience: 2
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Dave Jacobson	BLM	Wilderness
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Melanie Peterson	BLM	Waste, Hazardous and Solid
Elvis Wall	BLM	Tribal Coordinator
Joe David	BLM	Environmental Coordinator

SECTION 8.0
INTERAGENCY COORDINATION AND DISTRIBUTION LIST

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The Proposed Action was briefed at the Joint Military Affairs Committee (JMAC) on February 27, 2008 held at the Bureau of Land Management, Las Vegas Field Office, by Colonel Michael Bartley, 99 ABW/CC. The agenda from the JMAC meeting is provided below:

Joint Military Affairs Committee (JMAC)
Winter 2008 Meeting
February 27, 2008
Bureau of Land Management, Las Vegas Field Office

AGENDA

GENERAL SESSION
4701 N. Torrey Pines Drive
Las Vegas, NV 89130-2301

08.00	***Welcome and Introduction**	**Mr. Michael Holbert** Deputy State Director for Resources, BLM, Nevada State Office
08.10	***Announcements** • Lunch • Nellis Tour • Next meeting date	**Maud Naroll,** Clearinghouse
08.20	***BLM**	
	• Southern Nevada Water Authority Pipeline EIS Update	**Penny Woods**, Groundwater Project Office
	• Unexploded Ordinance	**Tom Seley**, Tonopah Field Station Manager
	• BLM wind and solar permit facility	**Jackie Gratton**, Realty Specialist
	• Resource Management Plan Update	**Mike Holbert,** Deputy State Director for Resources
09.50	**Letters to Commanding Officers** **NAS Fallon** **Nellis AFB**	**Governor's Office**
10:00	**BREAK**	
10:20	***Fallon Naval Air Base Update** • Development Legislation (Encroachment) • Predatory Lending Legislative Initiative	**Zip Upham**, NAS Fallon Public Affairs Officer

10:45 ***Hawthorne Army Depot** **Lt. Col Hardee Green**

- Elemental Mercury Storage
- New Geothermal Projects

11:05 ***Nellis Air Force Base Update** **Col Bartley**

- Patriot Exercise
- N Las Vegas Waste Water Treatment Facility
- Creech Air Force Base Waste Water Treatment Facility
- Creech Air Force Base Growth
- EPA Performance Track Program
- Photo Voltaic Array

11:35 ***Nevada National Guard** **Mr. Forest Fox**

- Update on Nevada National Guard's Activities

11:55 **Electricity Transmission and Southern Nevada Land Issues**

12:15 **Upcoming State Agency Regulations** Conservation and Natural Resources

- Update on any changes that will affect the military and federal agencies

12:35 **JMAC Charter Presentation** **TBA**

- Reading of Draft proposed by JMAC charter sub-committee
- General Discussion
- **Charter signing**

***SUMMARY OF THE SESSIONS & CLOSING REMARKS** **TBA**

1:30 **LUNCH BREAK**

Nellis Tour

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Alamo, Nevada 89001-0239

Caliente Branch Library
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Las Vegas Library
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1 NOTICE OF AVAILABILITY
2

U.S. Air Force Invites Public Comments on the Draft Environmental Assessment for a Communications Use Lease from the Bureau of Land Management to Conduct Patriot Communications Exercises in Lincoln County, Nevada

The U.S. Air Force (USAF) announces the availability of a draft Environmental Assessment (EA) analyzing potential impacts from the USAF proposal for a 15-year Communications Use Lease for public lands administered by the Bureau of Land Management (BLM) to conduct Patriot ground-to-air communications exercises. The exercises would be conducted on 14 parcels spread throughout Lincoln County in Sand Springs Valley, Coal Valley, Dry Lake Valley, and Delamar Valley. Each parcel would encompass 5.7 acres. The BLM is a cooperating agency on the proposed action.
Beginning on April 11, 2008, you may view the draft EA and draft Finding of No Significant Impact (FONSI) at: http://www.nellis.af.mil/library/environment.asp
http://www.nv.blm.gov/ely/nepa/ea_list.htm or request a copy from the address below.

Hard copies are available for review at Las Vegas Library, Reference Department, 833 Las Vegas Blvd North, Las Vegas; Caliente Branch Library, 100 Depot Avenue, Caliente; and Alamo Branch Library, 100 South First West, Alamo. Please provide any comments on the draft EA and draft FONSI by May 10, 2008 to:

Mr. Mike Estrada

99TH AIR BASE WING/OFFICE OF PUBLIC AFFAIRS (99ABW/PA)
4430 Grissom Ave., Suite 107, Nellis AFB, NV 89191

For general information, contact Mr. Estrada at: (702) 652-2753

SECTION 9.0
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_____. 1999. Renewal of the Nellis Air Force Range Land Withdrawal Legislative Environmental Impact Statement. March. (Sourced from USAF Integrated Natural Resources Management Plan, Nellis Air Force Base/Nellis Air Force Range. 99th Air Base Wing, Environmental Management Directorate, Nellis Air Force Base, Nevada, 1997).

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Lincoln County. 2004. Website: http://www.lincolncountynevada.us/info.html. Accessed November 29.

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USAF (U.S. Air Force). 1999. Renewal of the Nellis Air Force Range Land Withdrawal: Legislative Environmental Impact Statement. March.

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APPENDIX A
SITE MAPS

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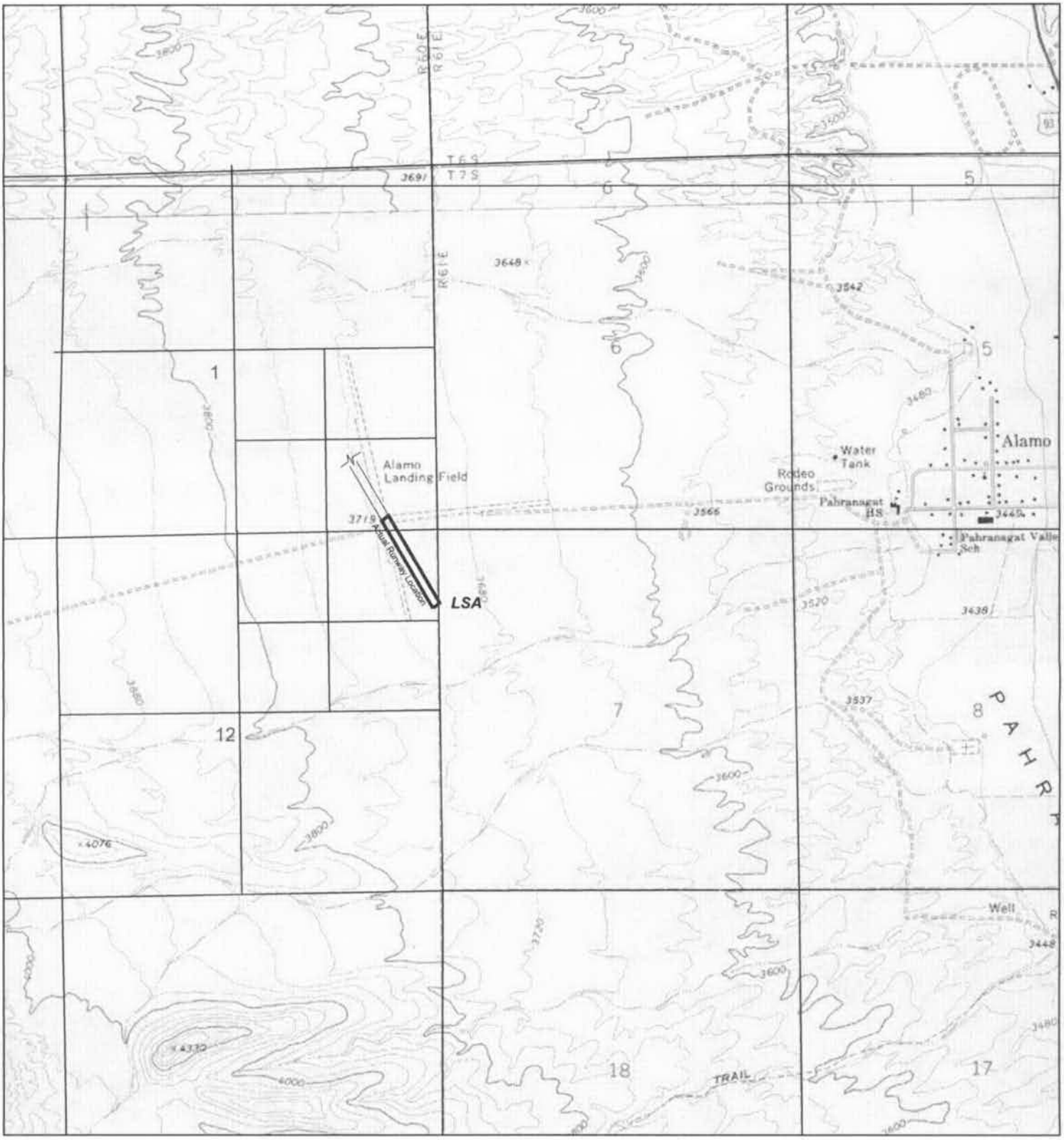


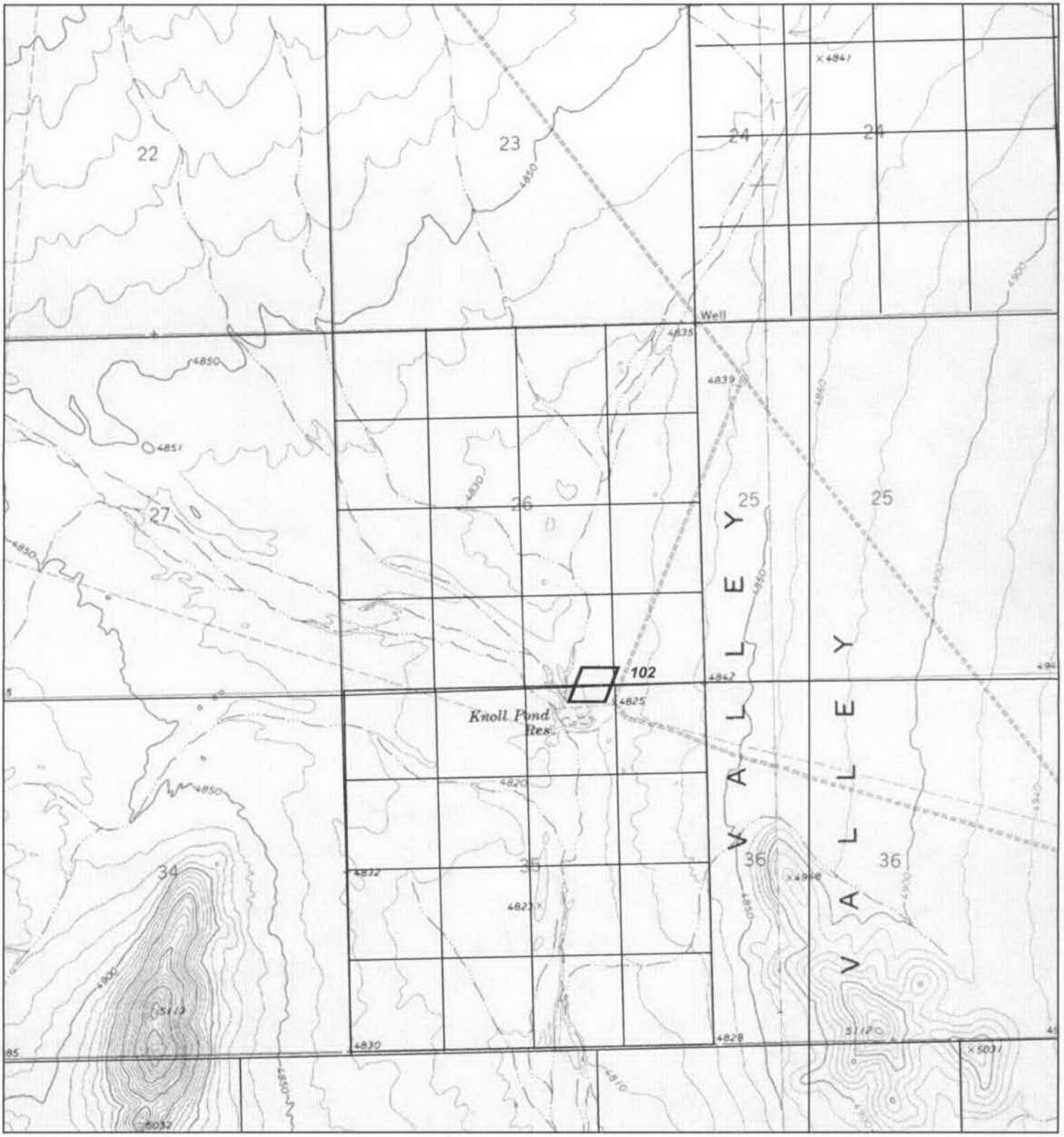
Township	Range	Sec.	Subdivision
7 S.	60 E.	1	S½SE¼SE¼,
		12	E½NE¼NE¼.

LSA

Quad: Alamo

Scale: 1" = 2,000'

NORTH



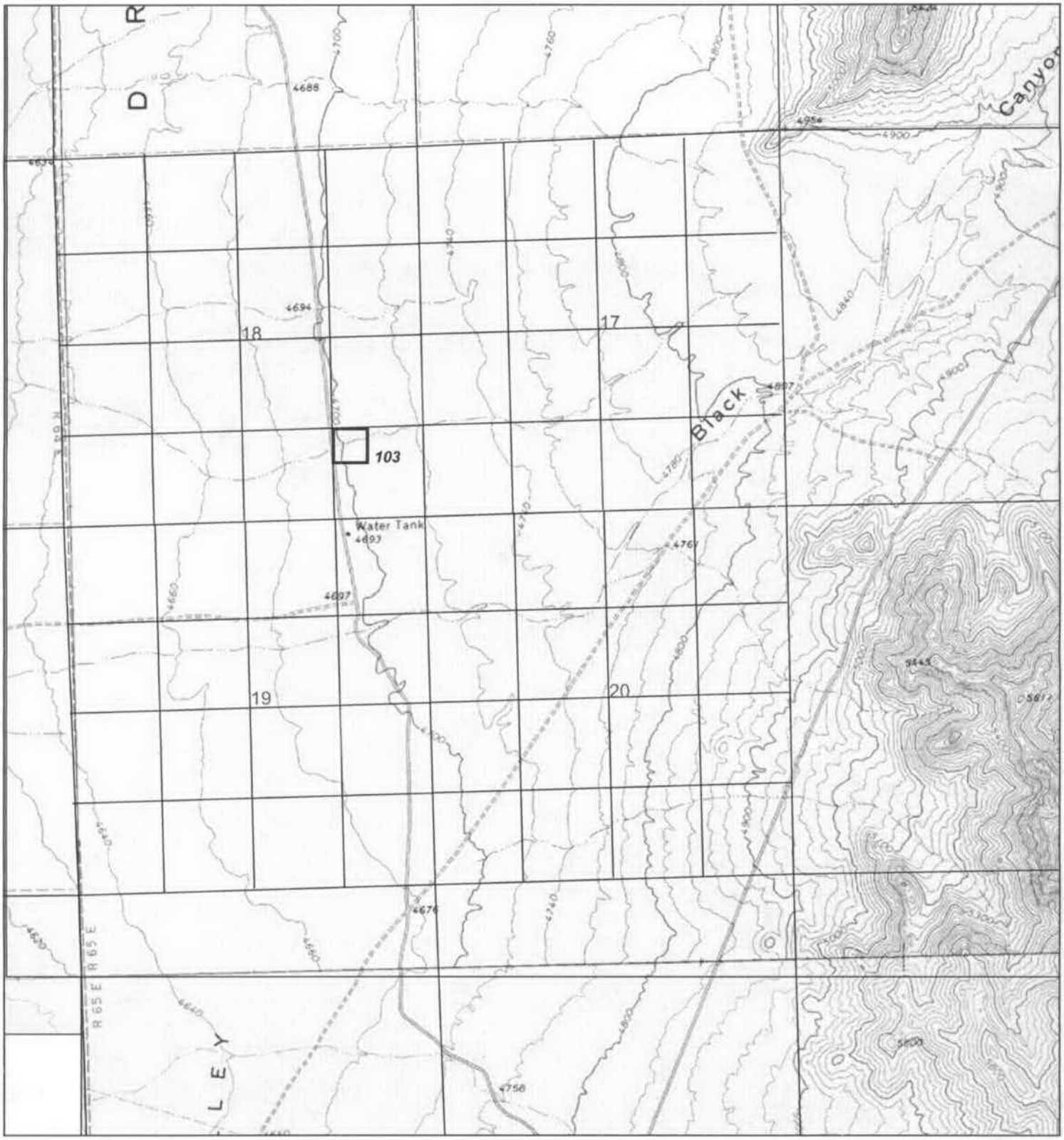
Township	Range	Sec.	Subdivision
4 S.	63 E.	26	SE¼SW¼SE¼,
		26	SW¼SE¼SE¼,
		35	NE¼NW¼NE¼.

Site 102

Quad: Pahroc Summit Pass

Scale: 1" = 2,000'

NORTH



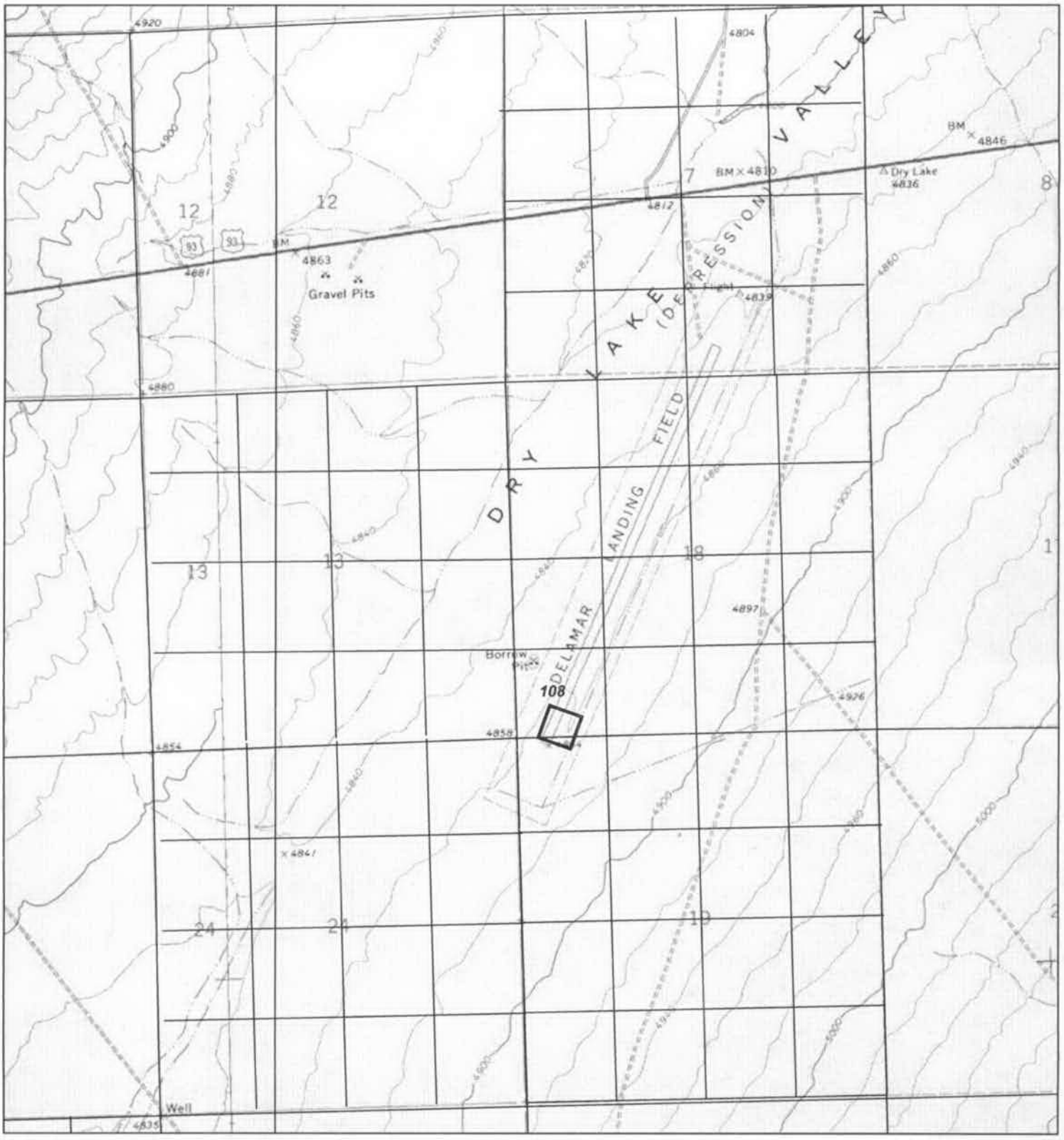
Township	Range	Sec.	Subdivision
4 S.	65 E.	18	NW¼SE¼SE¼.

Site 103

NORTH

Quad: The Bluffs

Scale: 1" = 2,000'



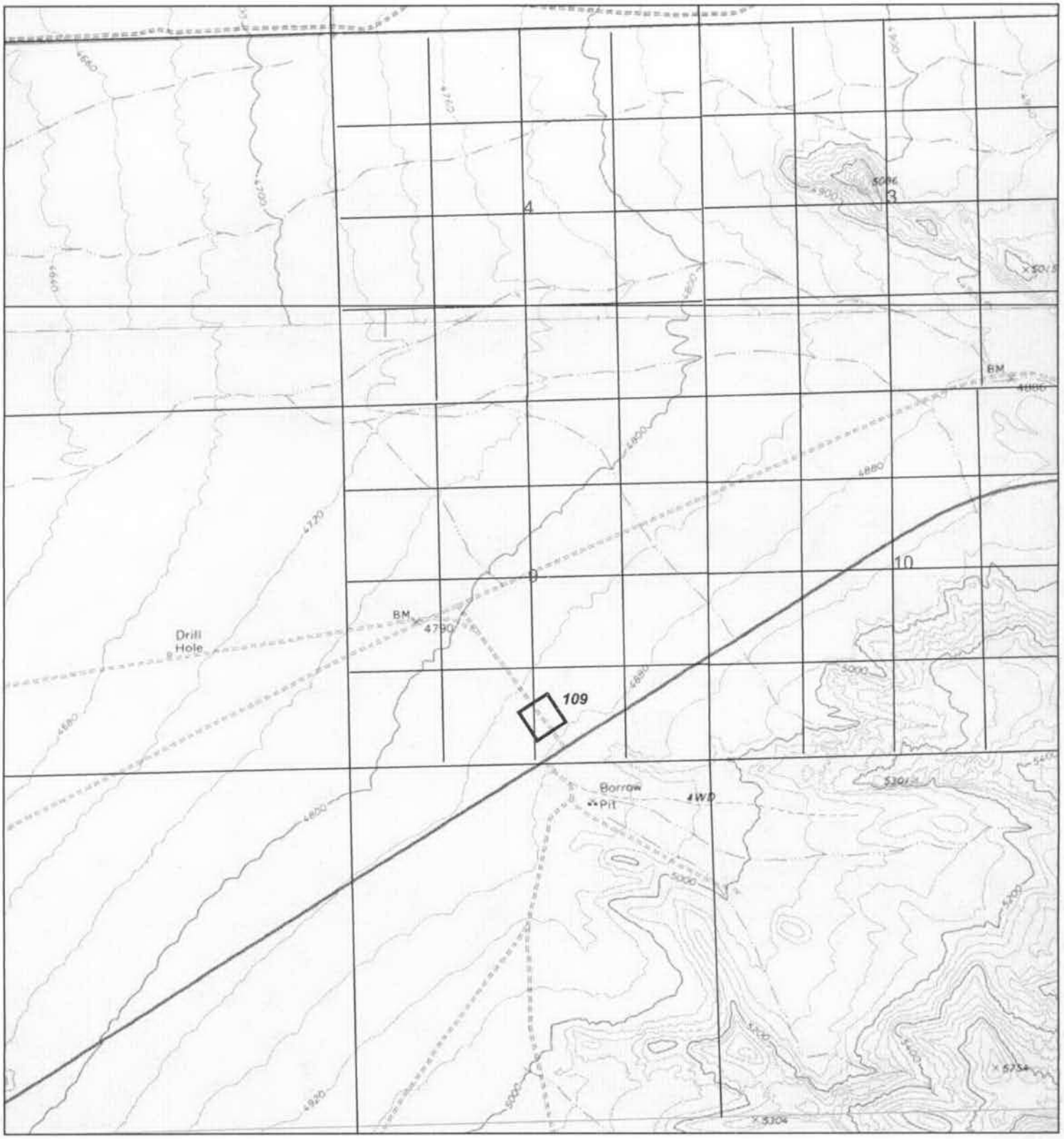
Township	Range	Sec.	Subdivision
4 S.	63 E.	18	S¼SW¼SW¼,
		19	N¼NW¼NW¼.

Site 108

NORTH

Quad: Pahroc Springs SE

Scale: 1" = 2,000'



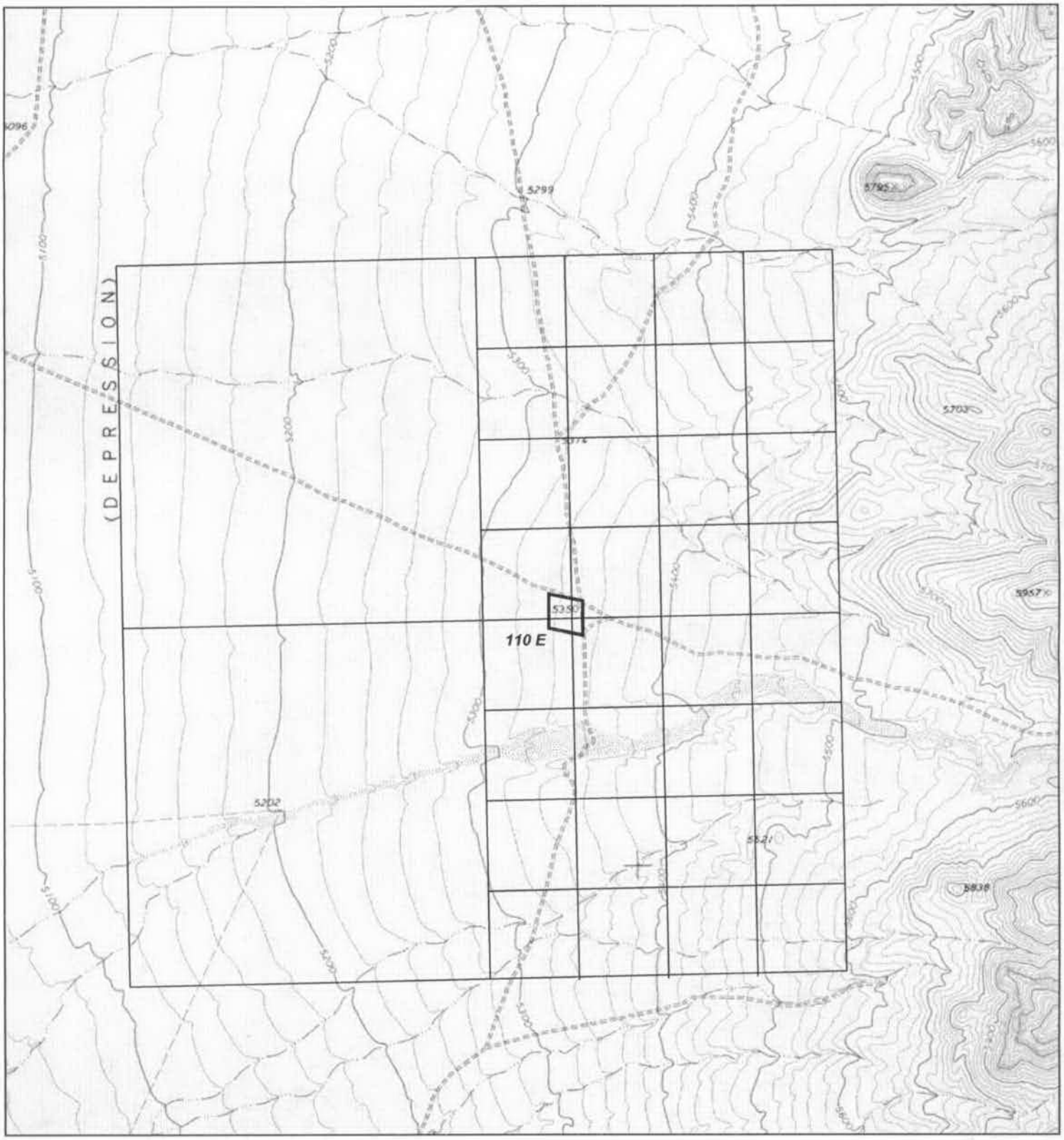
Township	Range	Sec.	Subdivision
4 S.	62 E.	9	E¼SE¼SW¼,
		9	W¼SW¼SE¼.

Site 109

Quad: Hiko SE

Scale: 1" = 2,000'

NORTH



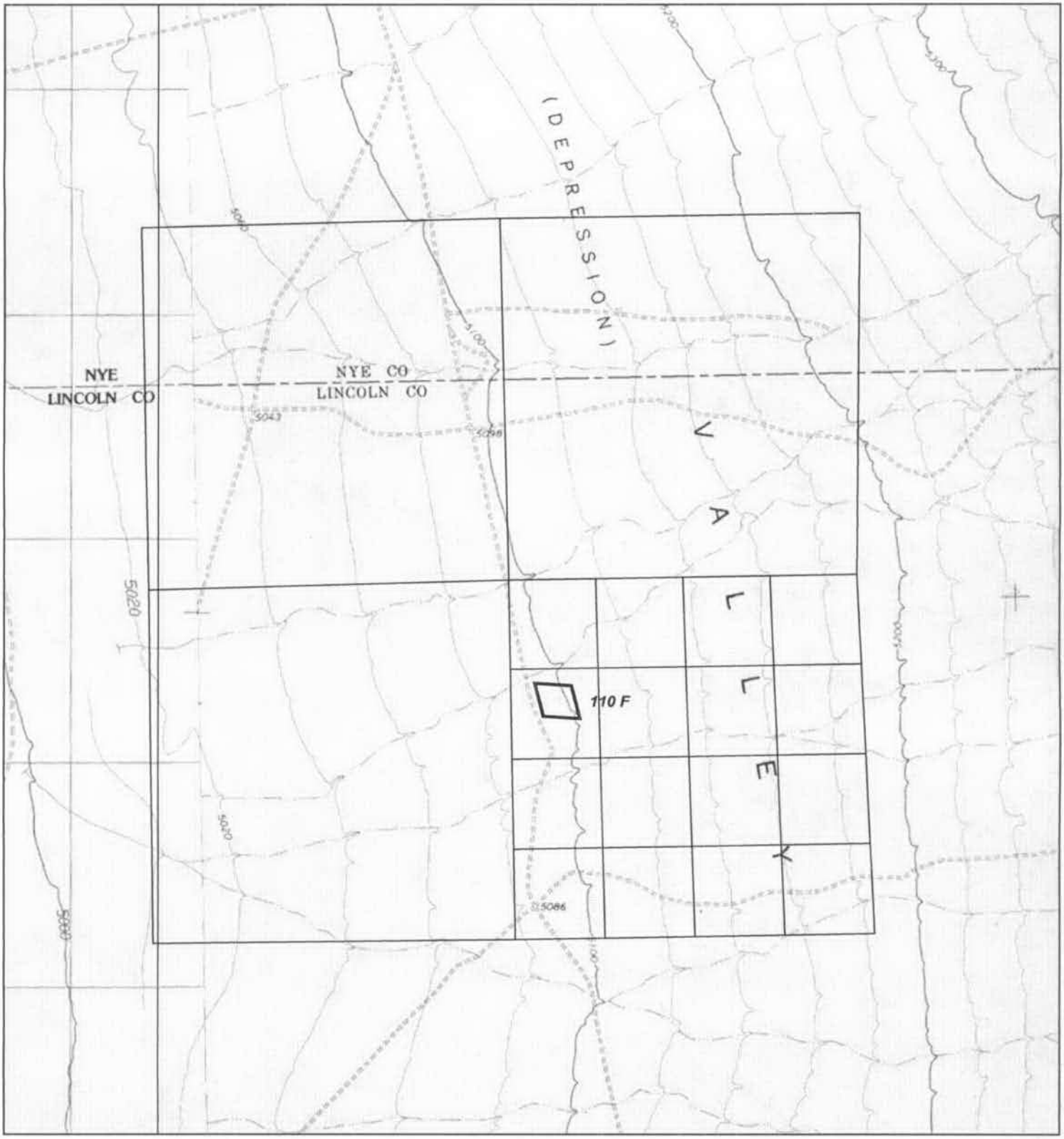
Township	Range	Sec.	Subdivision
1 N.	60 E.	23	SE¼SW¼SW¼,
		23	SW¼SE¼SW¼,
		26	NE¼NW¼NW¼,
		26	NW¼NE¼NW¼.

Site 110E

Quad: Oreana Springs

Scale: 1" = 2,000'

NORTH



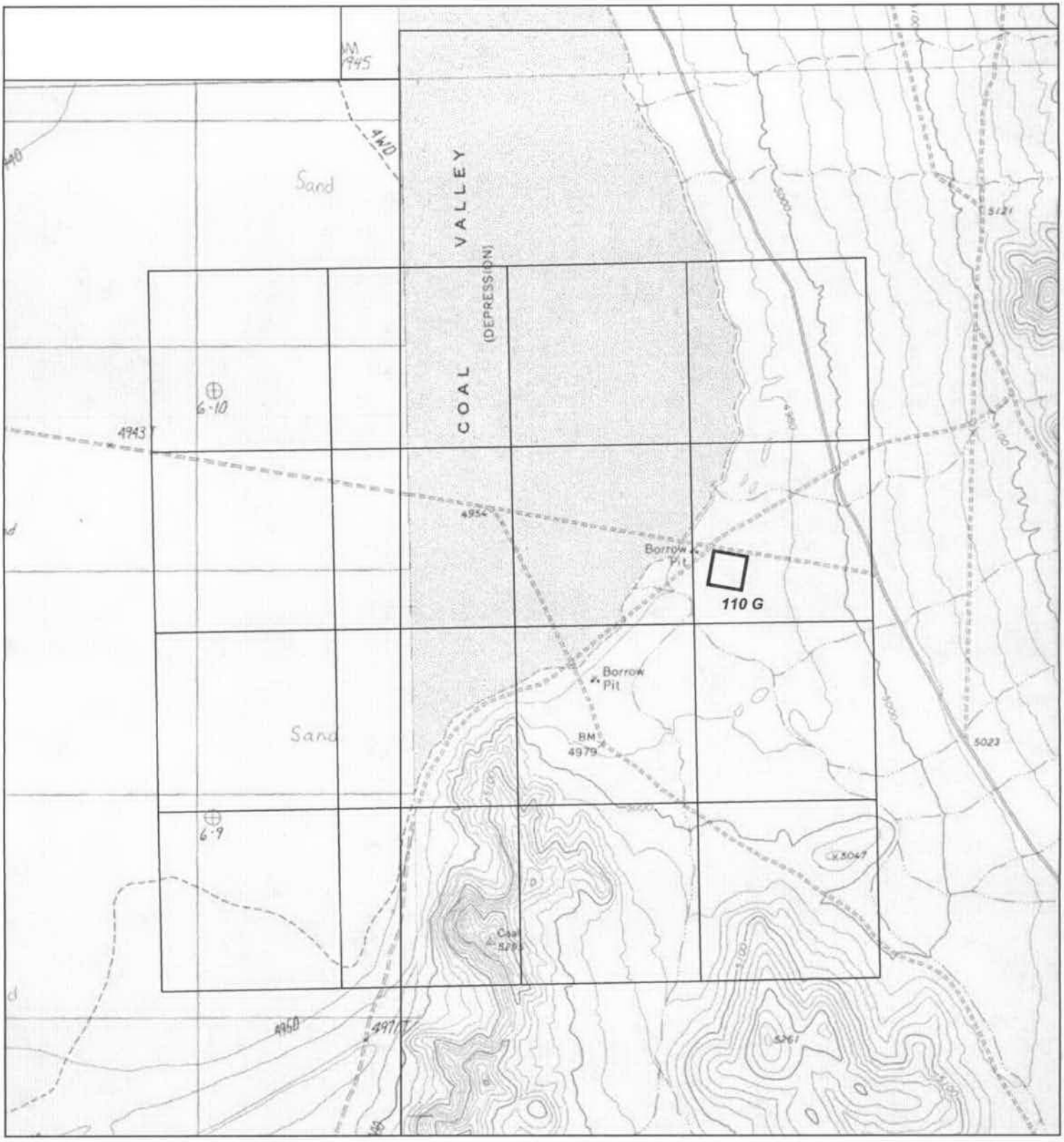
Township	Range	Sec.	Subdivision
2 N.	60 E.	15	S½SW¼NW¼.

Site 110F

Quad: Timber Mt. Pass West

Scale: 1" = 2,000'

NORTH



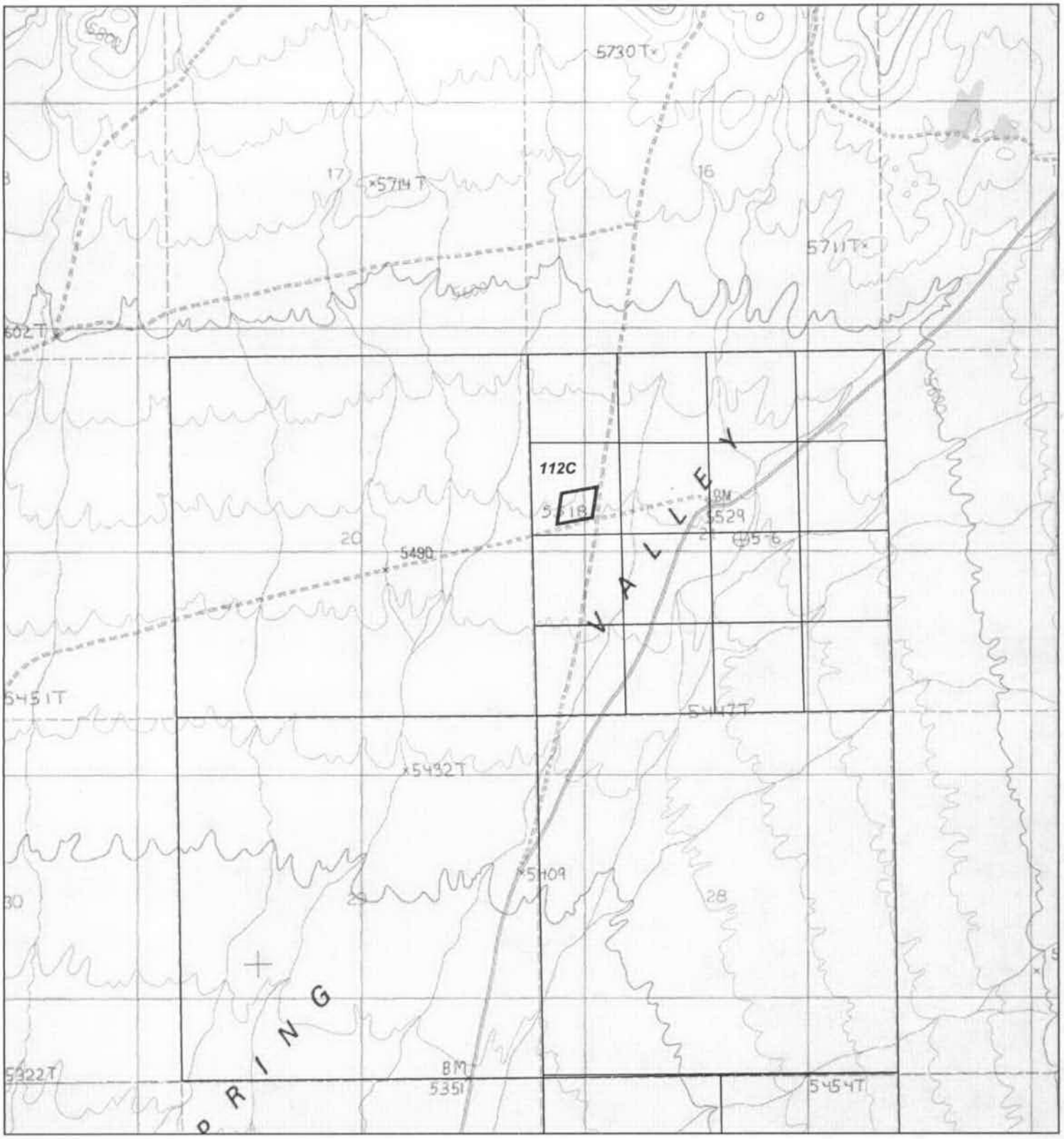
Township	Range	Sec.	Subdivision
1 S.	60 E.	23	SW¼SE¼.

Site 110G

Quad: Seaman Wash

Scale: 1" = 2,000'

NORTH



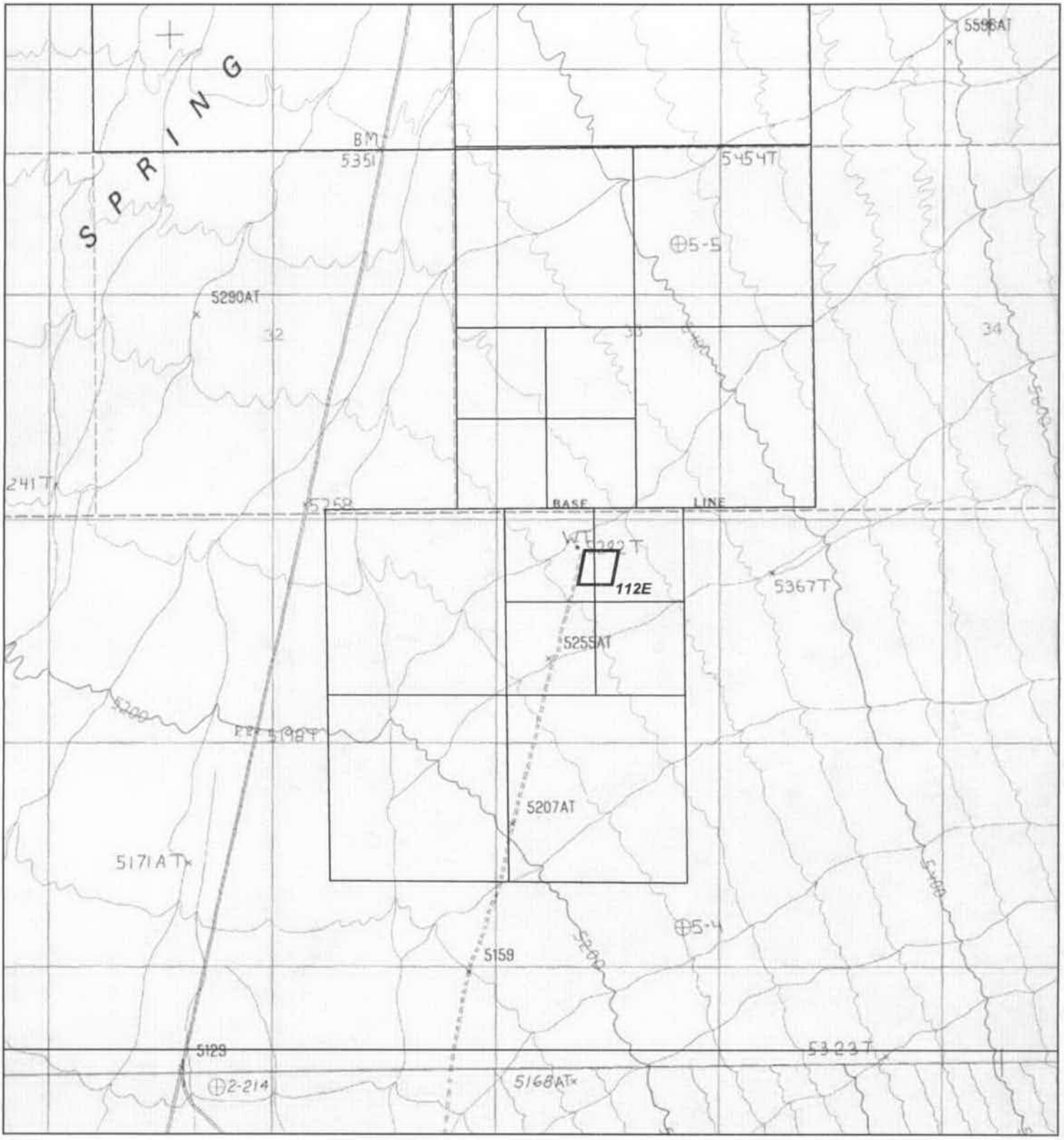
Township	Range	Sec.	Subdivision
1 N.	56 E.	21	S½SW¼NW¼.

Site 112C

Quad: McCutchen Spring

Scale: 1" = 2,000'

NORTH



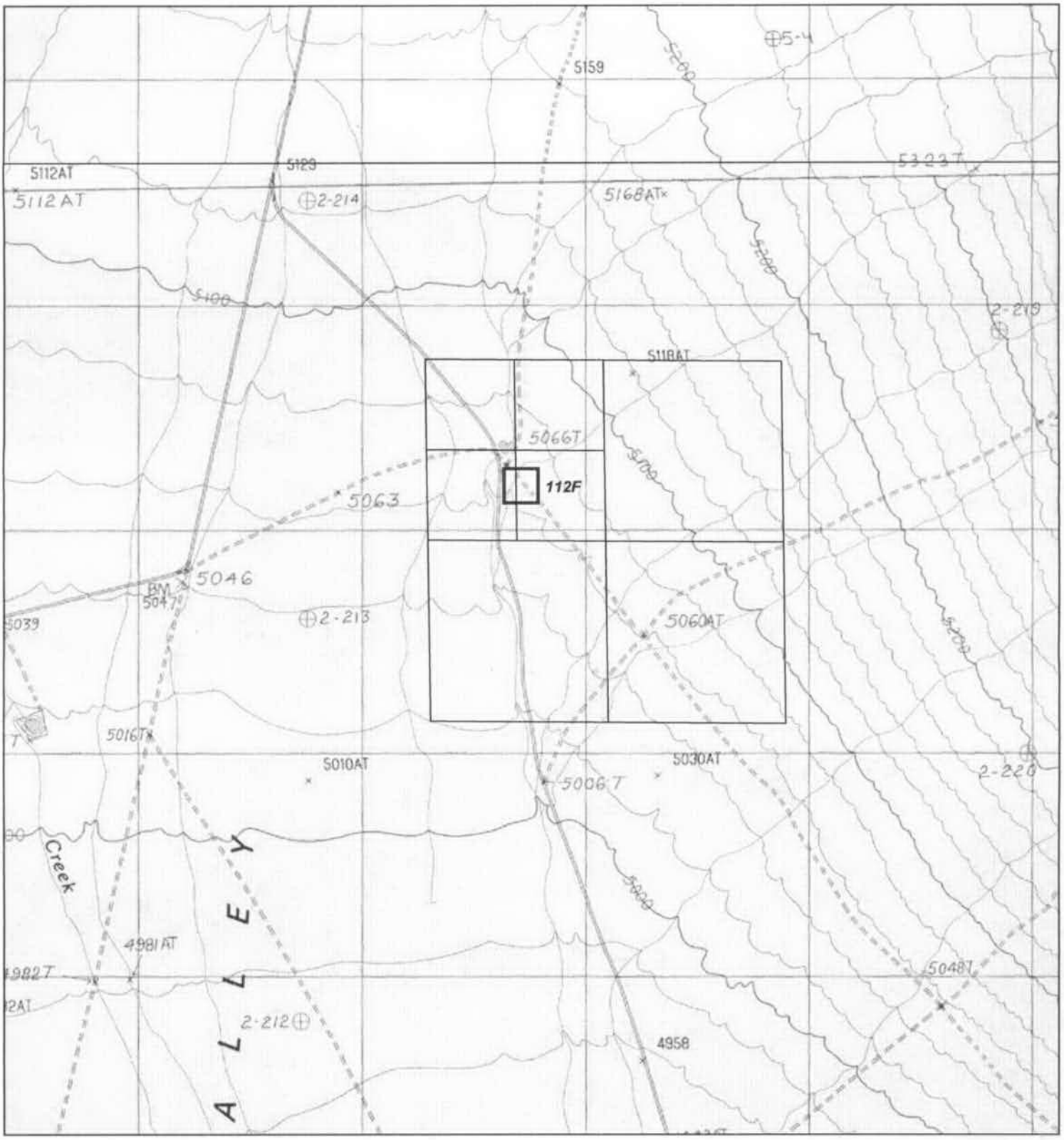
Township	Range	Sec.	Subdivision
1 S.	56 E.	4	E¼NW¼NE¼,
		4	W¼NE¼NE¼.

Site 112E

Quad: McCutchen Spring

Scale: 1" = 2,000'

NORTH



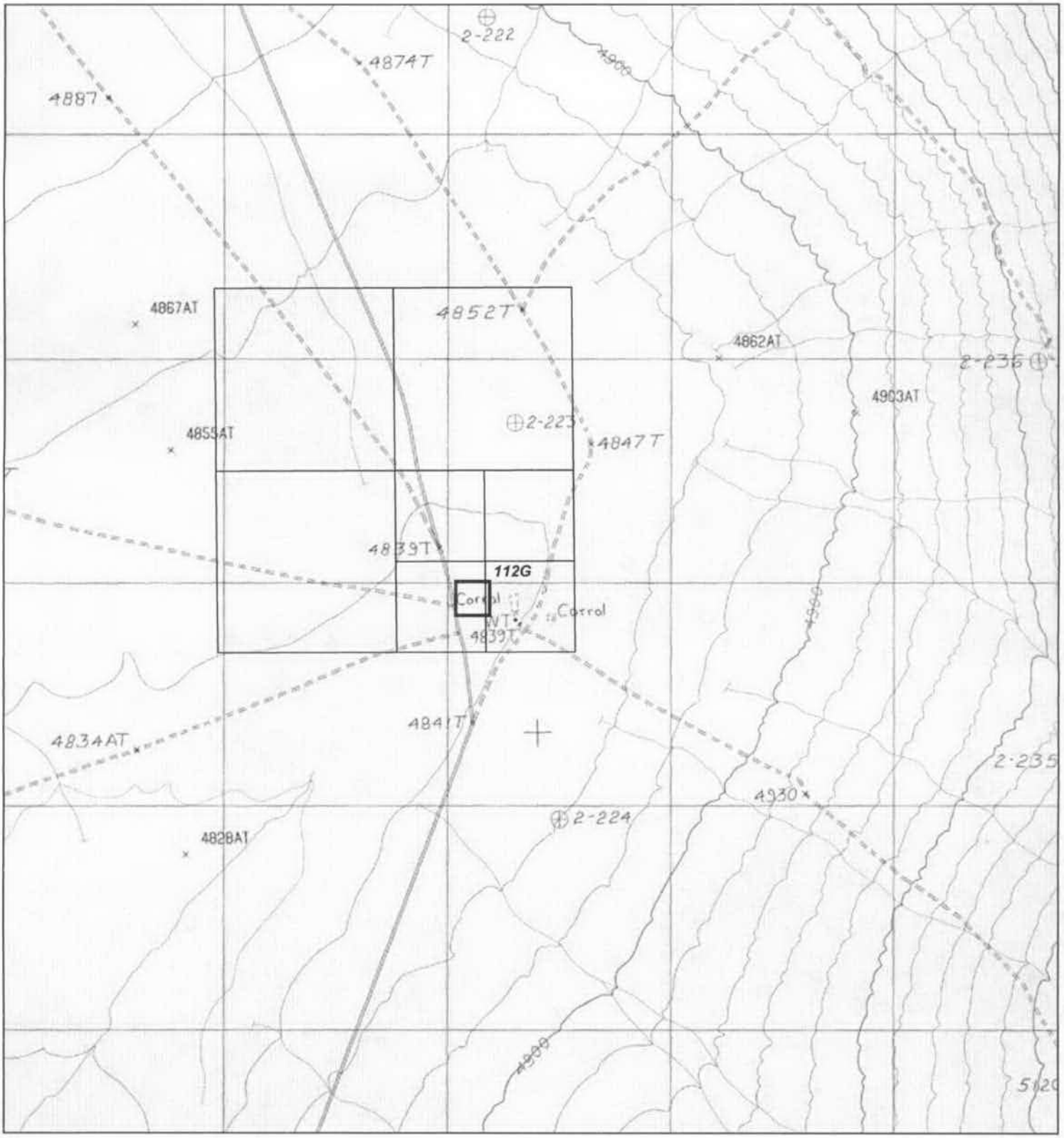
Township	Range	Sec.	Subdivision
1 S.	56 E.	16	E¼SW¼NW¼,
		16	W¼SE¼NW¼.

Site 112F

Quad: Worthington Peak SW

Scale: 1" = 2,000'

NORTH



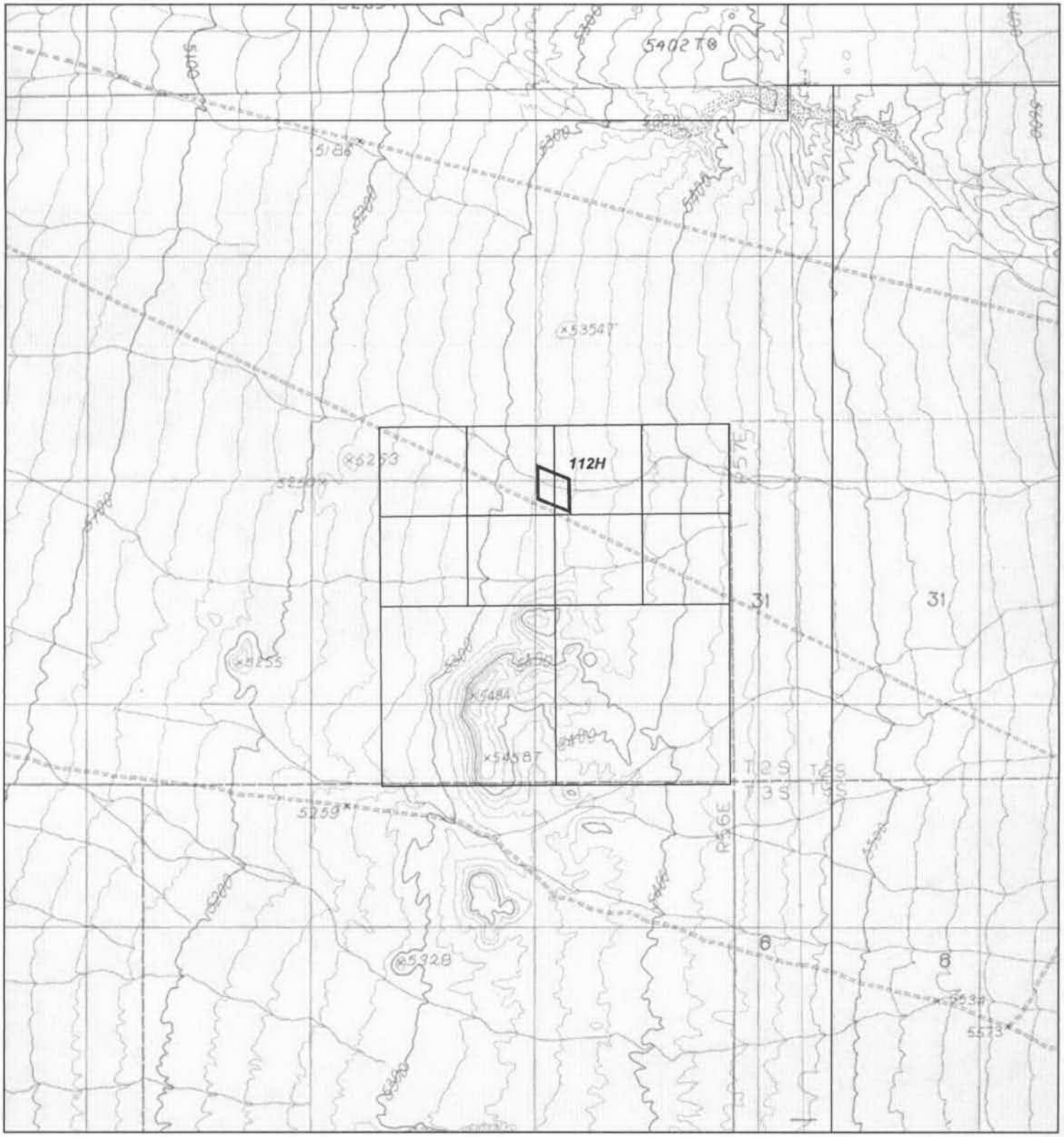
Township	Range	Sec.	Subdivision
2 S.	56 E.	3	E¼SW¼SE¼.

Site 112G

Quad: Worthington Peak SW

Scale: 1" = 2,000'

NORTH



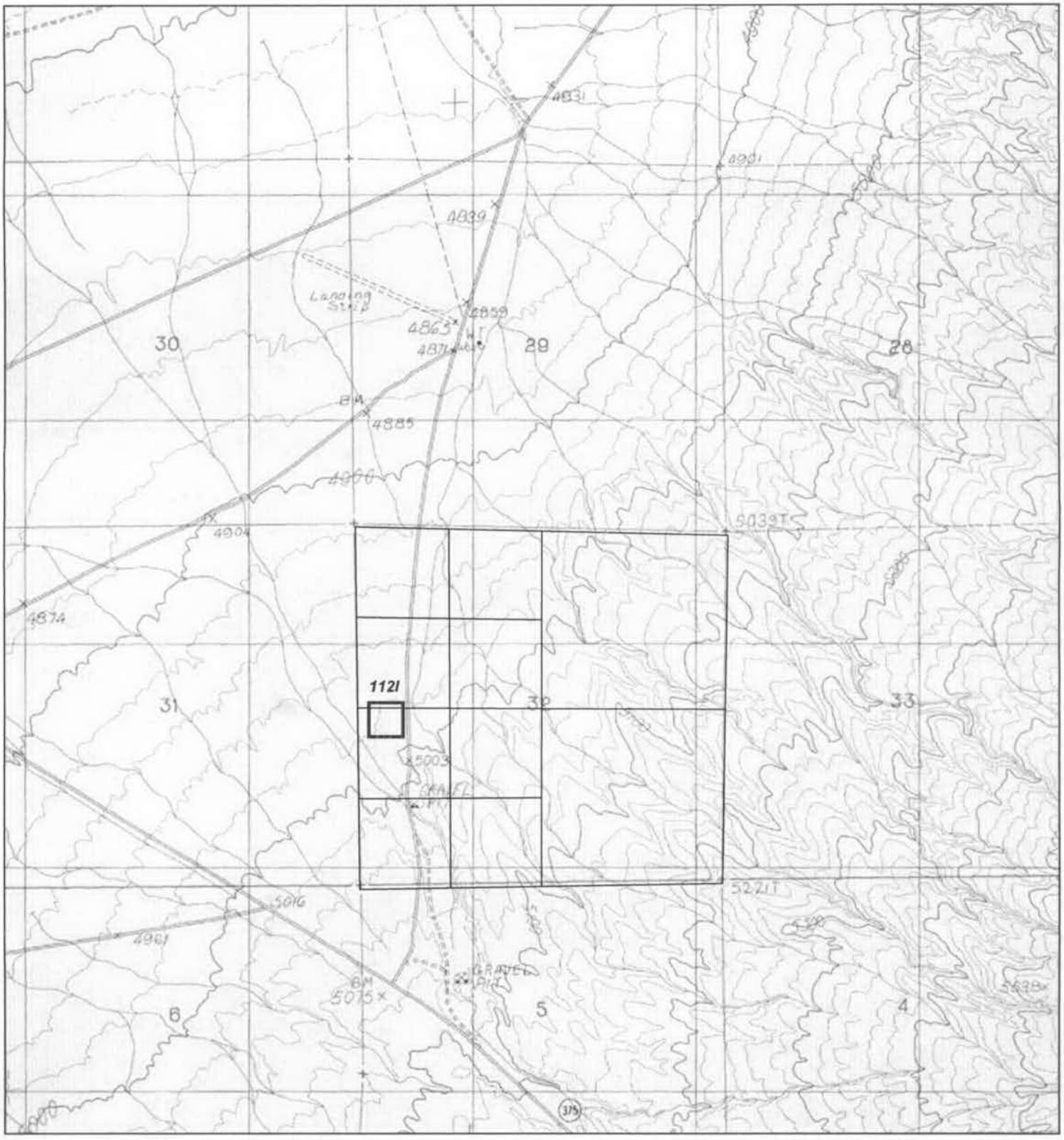
Township	Range	Sec.	Subdivision
2 S.	56 E.	36	SE¼NE¼NW¼,
		36	SW¼SW¼NE¼.

Site 112H

Quad: Tempiute Mt. North

Scale: 1" = 2,000'

NORTH



Township	Range	Sec.	Subdivision
3 S.	56 E.	32	SW¼SW¼NW¼,
		32	NW¼NW¼SW¼.

Site 112I

NORTH

Quad: Tempiute Mt. North

Scale: 1" = 2,000'

APPENDIX B
STANDARD OPERATING PROCEDURES

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The following SOPs have been incorporated into the proposed Radar/Communications activities to reduce or eliminate potential significant environmental impacts:

- No tracked vehicles will be used unless authorized by the BLM. (Biology, Land Use, Water and Earth Resources)
- No earthen berms or foxholes will be constructed. (Biology, Land Use, Water and Earth Resources, Grazing)
- No live or blank ammunition will be carried or used, no munitions simulators will be used. (General, Safety)
- The USAF is responsible for each Patriot and Sentinel unit to ensure safety and environmental requirements/restrictions are being observed. The USAF will approve the relocation of Sentinel units, document any environmental violation, and coordinate with the Army and the BLM if reclamation is required upon completion of the ground activities. (General, Biology, Water and Earth Resources, Land Use, Noise, Safety)
- Ground-based units will use GPS to ensure they are located within proposed site boundaries. Proposed Patriot Battery bivouac areas will be clearly delineated on maps. (General, Biology, Water and Earth Resources, Land Use, Noise, Grazing)
- The USAF will ensure that vehicle engine idling shall be limited to essential activities. Vehicles will not be left idling when not in use. (Air Quality)
- The USAF will ensure that all vehicle speeds will be within posted speed limits or at Army doctrinal convoy training speeds. Any off-road vehicle positioning in approved areas will be done at slow speeds to minimize dust and wildlife impacts. (Air Quality, Biology, Land Use, Grazing)
- No digging shall occur at field sites. Vegetation may be cleared to place tents and mobile field kitchens. Outriggers will be installed to stabilize equipment platforms. No fences will be cut. Any gates opened to allow large vehicles to pass will be closed immediately. (Biology, Water and Earth Resources, Cultural, Land Use, Safety)
- All vehicles and heavy equipment used for the proposed ground activities authorized for off-road driving that contact plant species listed on the Nevada Noxious Weed list or specifically identified by the BLM Ely Field Office shall be cleaned prior to continued use in weed-free areas. (Biology, Land Use, Grazing)
- Nellis AFB shall present a tortoise education program to all personnel who may encounter desert tortoise during the exercise. (General, Biology)
- If desert tortoise or signs of desert tortoise are observed, the observation shall be reported to the Nellis AFB Natural Resources Manager. (Biology)
- Activities that may endanger a tortoise will cease if a tortoise is found in harms way as a result of the exercise. Radar/Communications activities will resume after the authorized biologist removes the tortoise from danger, the activity will avoid the tortoise, or after the tortoise has moved to a safe area. (Biology)
- All personnel will check under vehicles and equipment prior to moving such vehicles and equipment. Desert tortoises often take cover beneath vehicles and equipment for shade. (Biology)
- To comply with BLM requirements, nesting surveys for migratory bird species would be conducted prior to emplacement of equipment in areas that would support nesting birds prior to the exercise to avoid impacts to species protected by the Migratory Bird Treaty Act. (Biology)
- The document *Protecting Burrowing Owls at Construction Sites in Nevada's Mojave Desert Region* will be adhered to in project locations containing burrowing owl habitat. (Biology)

- The document *Gila Monster Protocol for Minimizing Impacts in the Construction Site* will be adhered to in project locations containing Gila monster habitat. (Biology)
- Trash and debris shall be removed from all sites daily, and stored in sealed waste containers. (Biology, Safety)
- Sites found to have experienced environmental damage requiring restoration will be restored by Nellis AFB with a BLM-approved seed mix at a time designated by the BLM after the Radar/Communications exercises are completed. Restoration methods, if required, will be determined in consultation between the USAF and the BLM. (Biology, Land Use)
- Radar/Communications sites shall not be used if ponded or flowing water is present. (Biology, Water and Earth Resources)
- Radar/Communications sites shall avoid areas with nesting birds (Biology).
- Gray water will not be disposed of on public lands (43 CFR 8365.1-1). (Water and Earth Resources)
- Ground-based personnel involved in the Radar/Communications activities shall remain at least a quarter of a mile from any known riparian water source. (Biology, Water Resources, Safety)
- 98 RANW shall notify 99 ABW/PA and 99 ABW/PA will notify rancher permittees who are scheduled to graze cattle in the vicinity of the proposed Radar/Communications sites prior to the initiation of the proposed Radar/Communications activities. (Grazing)
- The exercises will not exclude or prevent livestock access to watering sites during an exercise. If a watering site is being utilized by livestock the Radar/Communications site will be avoided or alternative water troughs will be made available to the cattle for the duration of the exercise. Alternative water sources for livestock will be coordinated with the BLM. (Grazing)
- In the event of an unplanned discovery of cultural resources during the proposed activity, all activities associated with the undertakings within 100 meters of the discovery must be halted, and the discovery appropriately protected until the proposed activity is completed. Upon project activity completion a BLM Authorized Officer must be notified of the discovery. (Cultural Resources)
- In the event of an unplanned discovery of human remains during the proposed activity, all activities associated with the undertakings within 100 meters of the discovery must be halted, the discovery appropriately protected, and a BLM Authorized Officer will be notified within 24 hours. Use of such a site shall not continue until a BLM Authorized Officer issues a Notice to Proceed (NTP). (Cultural Resources)
- Drip pans shall be placed under all parked vehicles to avoid contaminating soils. (Water and Earth Resources, Safety)
- A large portable containment berm shall be placed under the truck that will be performing the fueling operations if parked on-site with fuel for 24 hours or more. The fueling area shall be covered with an impermeable containment berm to ensure there is no fuel leakage to the environment during vehicle refueling activities. (Water and Earth Resources, Safety)
- All liquid POL, hazardous material, and hazardous waste containers should be placed on a portable containment pallet to contain any spillage that may occur. (Water and Earth Resources, Safety)
- Contaminated soils will be removed and disposed of appropriately by Nellis AFB. Disposal of hazardous wastes will be in compliance with applicable laws and regulations. (Water and Earth Resources, Safety)
- Material Safety Data Sheets will be readily available to all personnel at the various sites. (Safety)
- Noxious weed measures shall include the following. Monitoring will be conducted for a period no shorter than the life of the permit and monitoring reports will be provided to the BLM. If the spread of noxious and non-native weeds is noted, appropriate weed control procedures will be determined in

consultation with BLM personnel and will be in compliance with the appropriate BLM handbook sections and applicable laws and regulations. All weed control efforts on BLM-administered lands will be in compliance with BLM Handbook H-9011, H-9011-1 Chemical Pest Control, H-9014 Use of Biological Control Agents of Pests on Public Lands, and H-9015 Integrated Pest Management. Should chemical methods be approved, the lessee must submit a Pesticide Use Proposal to the Authorized Officer 60 days prior to the planned application date. A pesticide Application Report must be submitted to the Authorized Officer by the end of the fiscal year follow chemical application. (Biology, Land Use, Grazing)

- Prior to the entry of vehicles and equipment to a project area, weed surveys will be conducted and areas of concern will be identified and flagged in the field by a weed scientist or qualified biologist. The flagging will alert personnel or participants to avoid areas of concern. These sites will be recorded using global positioning systems or other Ely Field Office approved equipment and provided to the Field Office Weed Coordinator or designated contact person. (Biology, Land Use, Grazing)
- Prior to entering public lands, the operator will provide information and training regarding noxious weed management and identification to all personnel who will be affiliated with the implementation and maintenance phases of the project. The importance of preventing the spread of weeds to uninfested areas and importance of controlling existing populations of weeds will be explained. (Biology, Land Use, Grazing)
- To eliminate the transport of vehicle-borne weed seeds, roots, or rhizomes all vehicles and heavy equipment used for the completion, maintenance, inspection, or monitoring of ground disturbing activities; for emergency fire suppression; or for authorized off-road driving will be free of soil and debris capable of transporting weed propagules. All such vehicles and equipment will be cleaned with power or high pressure equipment prior to entering or leaving the work site or project area. Vehicles used for emergency fire suppression will be cleaned as a part of check-in and demobilization procedures. Cleaning efforts will concentrate on tracks, feet and tires, and on the undercarriage. Special emphasis will be applied to axels, frames, cross members, motor mounts, on and underneath steps, running boards, and front bumper/brush guard assemblies. Vehicle cabs will be swept out and refuse will be disposed of in waste receptacles. Cleaning sites will be recorded using global positioning systems or other mutually acceptable equipment and provided to the Field Office Weed Coordinator or designated contact person. (Biology, Land Use, Grazing)
- To eliminate the introduction of noxious weed seeds, roots, or rhizomes all interim and final seed mixes, hay, straw, hay/straw, or other organic products used for reclamation or stabilization activities, feed, bedding will be certified free of plant species listed on the Nevada noxious weed list or specifically identified by the BLM Ely Field Office. (Biology, Land Use, Grazing)
- Removal and disturbance of vegetation would be kept to a minimum through construction site management (e.g. using previously disturbed areas and existing easements, limiting equipment/materials storage and staging area sites, etc.). (Biology, Land Use, Grazing)
- Reclamation would normally be accomplished with native seeds only. These would be representative of the indigenous species present in the adjacent habitat. Rationale for potential seeding with selected nonnative species would be documented. Possible exceptions would include use of non-native species for a temporary cover crop to out-compete weeds. In all cases, seed mixes would be approves by the BLM Authorized Officer prior to planting. (Biology, Land Use, Grazing)
- Mixing of herbicides and rinsing of herbicide containers and spray equipment would be conducted only in areas that are safe distance from environmentally sensitive areas and points of entry to bodies of water (storm drains, irrigation ditches, streams, lakes, or wells). (Biology, Land Use, Water Resources, Safety, Grazing)
- Methods used to accomplish weed and insect control objectives would consider seasonal distribution of large wildlife species. (Biology).

APPENDIX C
AIR QUALITY TABLES

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Table C.1-1
Vehicle Miles Traveled VMT Estimate

Alternative	Paved Road VMT			Unpaved Road VMT			Total VMT
	LHDT VMT	MHDT VMT	HHDT VMT	LHDT VMT	MHDT VMT	HHDT VMT	
Proposed Exercise	18,104	10,758	26,672	8,484	1,502	4,264	69,784

Notes:
LHDT1 = Light Heavy-Duty Trucks (8501-10000 lb GVWR) = Humvee
MHDT = Medium Heavy Duty Trucks (14,001-33,000 GVWR) = M900 Series 5-ton Trucks
HHDT = Heavy-Heavy-Duty Trucks (33,001+ lb GVWR) = M970/980 HEMTT Heavy Trucks

Table C.1-2
Vehicle Emission Factors and Travel Summary

Emission Factor Summary

Pollutant	Vehicle Type	Idle g/hour	20 mph g/mi	30 mph g/mi	55 mph g/mi
PM10	LHDT1	1.258	0.102	0.08	0.061
PM10	MHDT	1.667	0.491	0.36	0.241
PM10	HHDT	2.003	0.544	0.405	0.278
NOx	LHDT1	80.7	6.055	5.344	7.276
NOx	MHDT	80.7	11.255	9.933	13.526
NOx	HHDT	80.7	15.862	13.998	19.062
VOC	LHDT1	5.017	0.453	0.326	0.21
VOC	MHDT	5.017	0.541	0.389	0.251
VOC	HHDT	5.017	1.246	0.896	0.577
CO	LHDT1	26.3	1.2	0.785	0.601
CO	MHDT	26.3	2.96	1.935	1.483
CO	HHDT	26.3	4.506	2.946	2.257
SO2	LHDT1	0.356	0.045	0.045	0.045
SO2	MHDT	0.356	0.131	0.131	0.131
SO2	HHDT	0.356	0.188	0.188	0.188

Source: CARB EMFAC 2000

Vehicle Travel Summary

		VMT		
Vehicle Type	Idle Hours	20 mph	30 mph	55 mph
Proposed Action - Clark County				
LHDT1	25	0	250	2,250
MHDT	22	0	220	1,980
HHDT	59	0	585	5,265
Proposed Action - Lincoln County				
LHDT1	709	8,484	0	15,604
MHDT	22	1,502	0	8,558
HHDT	59	4,264	0	20,822

Notes:
LHDT1 = Light Heavy-Duty Trucks (8501-10000 lb GVWR) = Humvee
MHDT = Medium Heavy Duty Trucks (14,001-33,000 GVWR) = M900 Series 5-ton Trucks
HHDT = Heavy-Heavy-Duty Trucks (33,001+ lb GVWR) = M970/980 HEMTT Heavy Trucks

Table C.1-3
Vehicle Travel Emission Summary

Alternative	Emissions (tons)				
Proposed Action	**NOx**	**CO**	**VOC**	**SOx**	**PM10**
Clark County	0.18	0.02	0.01	0.00	0.00
Lincoln County	0.91	0.14	0.03	0.01	0.02
Total	1.09	0.16	0.04	0.01	0.02

Note: tailpipe emissions only, road dust emissions presented separately

Table C.1-4
Fugitive Dust Emission Factor and Emission Calculation

Unpaved Road Dust Emission Factor Calculation

Vehicle Wt. Avg. Tons	Soil Silt (%)	EF lb/VMT	Proposed Action	
			VMT	PM10 tons
15	28	6.63	14,250	47.27

Paved Road Dust Emission Factor Calculation

Vehicle Wt. Avg. Tons	Silt Load g/m2	EF g/mi	Proposed Action	
			VMT	PM10 tons
20	0.2	0.061	55,534	1.70

Clark County Paved Road Dust	VMT	PM10 tons
Proposed Action	10,550	0.32

Unpaved Road soil silt content is based on SCAQMD factor for City and County Roads.
Paved Road Silt Loading is worst case assumption neglecting high ADT roads in Clark County

Table C.1-5
Stationary Source Emission Factors and Emission Estimates

Proposed Action	Equipment Assumptions			Emission Factors g/bhp					Load	Equipment Usage			Horsepower	Total Generator Emissions Tons				
Generator Emissions	HP	HP Cat.	Tier	NOx	CO	VOC	SOx	PM10	(fraction)	(hr/day)	(days)	(pieces)	Hours	NOx	CO	VOC	SOx	PM10
EPP Generators	210	175-300	1	5.58	0.75	0.31	0.0455	0.20	0.75	24	12	4	181,440	1.12	0.15	0.06	0.01	0.04
Launching Station Generators	22	16-25	1	4.44	2.16	0.44	0.0505	0.21	0.75	4	12	16	12,672	0.06	0.03	0.01	0.00	0.00
ICC and CRG Generators	45	25-50	1	4.73	1.53	0.28	0.0506	0.28	0.75	24	12	8	77,760	0.41	0.13	0.02	0.00	0.02
Sentinel Generators	15	11-16	1	4.44	2.16	0.44	0.0505	0.21	0.75	12	12	2	3,240	0.02	0.01	0.00	0.00	0.00
LDS Generators	45	25-50	1	4.73	1.53	0.28	0.0506	0.28	0.75	24	12	6	58,320	0.30	0.10	0.02	0.00	0.02
														1.90	0.42	0.11	0.02	0.09

Emission Factors are based on EPA Guidance Document "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling — Compression-Ignition".

Table C.1-6
Emission Summary

Alternative	Emissions (tons)				
Proposed Action	**NOx**	**CO**	**VOC**	**SOx**	**PM10**
Clark County	0.18	0.02	0.01	0.00	0.33
Lincoln County	2.81	0.55	0.15	0.03	48.75
Total	2.99	0.58	0.15	0.03	49.07

Note: Clark County portion of Proposed Action is provided for General Conformity purposes.